The Egyptian Journal of Hospital Medicine (January 2024) Vol. 94, Page 815-825

Assessment of Knowledge, Attitude and Barriers to Practice Regarding Evidence Based Medicine among Doctors in National Liver Institute, Menoufia University, Egypt

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ABSTRACT

Background: Evidence based medicine (EBM) helps physicians to provide patients with the best possible clinical care through systemically reviewing, critically appraising, and using findings of the clinical research. The essence of EBM lies in its ability to bridge the gap among scientific knowledge and clinical practice, fostering a patient-centered approach that ensures informed decision-making and improved health outcomes. **Objective:** This study aims to assess EBM knowledge, attitude, and barriers to practice among doctors in National Liver Institute (NLI), Menoufia University, Egypt. **Subjects and Methods:** This is a cross sectional questionnaire-based study, included 150 medical staff personnel from different specialties in National Liver Institute. Data were analyzed utilizing descriptive statistics. Chi-square test, Fischer's exact test and logistic regression model were used to study factors affecting knowledge scores among the studied medical staff participants. **Results:** About one third of the studied participants (37.3%) attended previous evidence based medicine training. About one third of the participants (36.7%) had good knowledge. Regarding attitude toward EBM, majority of the participants (91.3%) had positive attitude. The most prevalent obstacles that the participants in this study agreed upon, were lack of time (62%), lack of clinic facilities (64.7%) and patient preferences (71.4%) and beliefs (69.3%). **Conclusions:** Variations in EBM knowledge and attitudes among healthcare professionals underscore the need for a strict understanding of individual, educational, and contextual factors that shape the adoption of evidence-based approaches.

Keywords: Evidence based medicine, Knowledge, Attitude, Egypt.

INTRODUCTION

Evidence-based medicine has been defined as "the conscientious, explicit, and judicious use of current best evidence in making decisions about the care of individual patients" as reported by Dr. David Sackett [(1)]. Lately, EBM was defined as "The integration of the best available research evidence with clinical expertise and patient values" [(2)].

Evidence-based practice refers to providing quality care for the patients taking into consideration patient's choices and behaviors, accessible clinical resources, and relevant and up-to-date scientific evidence under the supervision and clinical training of a healthcare provider [(3)]. Consequently, it provides the best treatment plan for the specific cases. It was found that patients who received treatment based on current research evidence have been shown to have better clinical results than those who did not [(4)].

EBM has been a core component of medicine from both academic and professional perspectives since the term first emerged officially in 1992[(5)]. This includes EBP, evidence-based health, evidence-based nursing, evidence-based health policy, in study methods, in medical education and training, and during internship/residency [(5)].

EBP is important for improving cases care, reducing costs and length of stay in hospital, enhancing cases satisfaction and elimination of unnecessary practices. Its good application provides better health care with low cost, the clinician reaches the best possible solution for his patient by using the best available evidence providing the patient with optimum health care. It also increases the quality of health care by preventing major mistakes in the course of treatment, so generally it can save lives of patients. For healthcare providers when they properly use EBM; this will save time, increase level and quality of provided medical services and increase health professional satisfaction [(6)].

Assessment of physicians' knowledge, attitudes, and practice (KAP) concerning Evidence based medicine may be valuable in determining the extent to which physicians use evidence based medicine in their day-to-day practice [(7)]. Many studies are carried out to assess (KAP) of healthcare workers towards evidence-based medicine especially in developed countries [(8)]. In Egypt, relatively few investigations have been performed to explore knowledge of health care providers toward evidence-based medicine, the ability to get to and critically appraise evidence and the obstacles hindering the development from opinion-based to evidence-based practice [(9-13)].

So, this research was conducted to assess knowledge, attitude of doctors in Menoufia National Liver Institute in Egypt regarding EBM and the barriers hindering its practice. Assessing the knowledge, attitude, and barriers to practice of doctors at the Menoufia National Liver Institute in Egypt regarding EBM is pivotal for ensuring evidence-based, high-quality patient care, fostering a positive and supportive culture of EBM, and addressing barriers that may hinder the integration of evidence-based practices into routine clinical care. It ultimately contributes to the continuous improvement of healthcare practices and outcomes within the institute. The specificity in specialize health

Received: 12/10/2023
Accepted: 12/12/2023

care setting and staff treating chronic liver disease patients that makes our study valuable and unique in the broader landscape of research on EBM in Egypt.

PARTICIPANTS AND METHODS

The study participants were medical staff working at National Liver Institute, Menoufia University according to the subsequent inclusion criteria: demonstrators, residents, and assistant lecturers employed in various departments of NLI. The participants became included in the investigation subsequent to getting informed consent.

Study design and setting

Study instrument: During the course of the research, data were collected utilizing one tool "adopted validated questionnaire" developed by **Hisham *et al.*** [(14)]. It was used to measure knowledge, attitude as well as barriers to implementation of EBM among NLI medical staff. Minimal modifications were made to the questionnaire to make it suitable for the current study participants (Demographic profile section as job position and department).

Procedure

The study's participants were chosen through the convenience sampling method. The evidence based medicine questionnaire (EBMQ) was distributed to the study participants, and the responses of characteristics, demographic information sources, knowledge, attitude and practice of evidence based medicine were gathered using paper version and online Google form. The information was subsequently exposed to additional statistical analysis. The coding and scoring system applied to the questionnaire was as the following:

Knowledge scoring:

The knowledge scale consists of 2 subdivisions (24 items), the first subdivision (8 items) about knowledge of specific EBM information sources with 4 categorical responses scored as 0, 1, 2 and 3 while the second subdivision (16 items) about knowledge of some statistical terms with 5 categorical responses scored as 0, 1, 2, 3 and 4. The grand total knowledge score was varying between 0 to 88. Each physician was categorized into "Poor Knowledge" if he/she had from 0-29 points of the total knowledge score, those who had 30-58 points were considered as "Fair Knowledge Level", and those who had 59-88 points were considered as "Good Knowledge Level" [(9)].

Attitude scoring:

In order to assess attitudes toward EBM, the attitude scale comprises eight items that are assessed utilizing a Likert scale with five points: Strongly Agree, Agree, Neither Agree nor Disagree, Disagree, Strongly Disagree. Higher scores indicate more positive attitudes from 0 to 4. The range of the total attitude score was 0 to 32. The attitude score was separated into 2 sections: the first half (zero to sixteen) represented negative attitudes, while the second half (seventeen to thirty-two) represented positive attitudes [(9)].

Sample size calculation

It is necessary to determine the sample size that is necessary in order to evaluate the level of KAP about evidence-based medicine within the medical team that is employed at the NLI, the investigators utilized Epi website ("Open Source Statistics for Public Health,") [(15)]. Our sample size ' Equation was: $n = [DEFF*Np (1-p)]/ [(d^2/Z^21-\alpha/2*(N-1) +p*(1-p)]$, where: DEFF is Design effect =1, Population size (N) is 256 medical individuals (resident doctors, Demonstrators and assistant lectures). knowledge Rate (from a pilot research) about evidence-based medicine (P) is 50 % $\pm$ 5%, Confidence limits (d) is 5%, and a power of 95%. The calculated sample size was 154, which we approximate to 150 medical staff participants. They were selected through convenience sampling from NLI medical staff (resident doctors, demonstrators, and assistant lecturers).

Ethical Considerations

Permission to conduct the study was received from the Epidemiology and Preventive Medicine Department, National Liver Institute, Menoufia University Egypt, in addition to approval from the Ethical committee at National Liver institute (NLI), Menoufia University (NLI IRP protocol number 00524). Verbal consent was taken from participated subjects in the study with brief description of the nature and purpose of the study. Confidentiality of the information assured.

Statistical analysis

The information was modified, encoded, and converted into a form that was specifically engineered to accommodate the personal computer input procedure. The data were entered and analyzed using version 22 of the SPSS (Statistical Package for the Social Sciences) statistical application. Graphs were generated with the assistance of Excel and SPSS. Qualitative data were described in terms of percentages and numbers. For quantitative information, the mean, standard deviation (SD), range, median, and interquartile range (IQR) were provided. Utilizing the chi-square test, the relationship between qualitative variables was investigated. In contrast, if any of the anticipated cells contained fewer than five, Fisher's exact test was used. $P < 0.05$ was designated as the significance level. A logistic regression model was employed to calculate the adjusted odds ratio and 95% confidence interval for the factors that predict medical team members to have adequate knowledge.

RESULTS

About one hundred and fifty medical staff participated in our study. Their mean age was 30.4 ± 2.3 years old; the majority were females and clinical staff. Although most of the participants had heard about EBM term only 37.3% attended previous training of EBM (Table 1).

Table (1): Distribution of socio-demographic data of the studied medical team participants (n=150)

Characteristics			N=150	%
Age				
	25-28 years		40	26.7
	28-31 years		61	40.7
	31-35 years		49	32.7
	Range		25 -35 years	
	Mean ± SD		30.4 ± 2.3	
	Median (IQR)		30 (28-32)	
Gender				
	Male		47	31.3
	Female		103	68.7
Current position				
	Resident doctor		55	36.7
	Demonstrator		36	24.0
	Assistant lecturer		59	39.3
Department				
	Academic		43	28.7
	Clinical		107	71.3
Years of experience				
	≤ 7 years		90	60.0
	> 7 years		60	40.0
	Range		2 – 14 years	
	Mean ± SD		6.67 ± 2.98	
	Median (IQR)		7 (4-9)	
Postgraduate qualification	No		75	50
	Yes		75	50
	Yes (n=75)	Master	73	97.4
		Diploma	1	1.3
		Others	1	1.3
Heard of the term EBM				
	No		8	5.3
	Yes		142	94.7
Attended a course or workshop on EBM				
	No		94	62.7
	Yes		56	37.3
Received any formal training in literature search				
	No		102	68
	Yes		48	32
Received any formal training in critical appraisal				
	No		110	73.3
	Yes		40	26.7

Table 2 displays frequency of usage of each source of information in the past one year, it reveals that the study participants' most frequently used sources of information were general databases (Google-Wikipedia), social media, colleagues and medical websites over textbooks, medical journals, clinical practice guidelines and online databases (Cochrane-Medline).

Table (2): Frequency of usage of different information sources by the studied medical team participants in the past one year

Information sources	Always (Several times a week)	Often (once a week)	Sometimes (at least once a month)	Rarely (once in a few month)	Never in the past 1 year	Not available
	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)
Textbooks	30 (20.0)	41 (27.3)	39 (26.0)	27 (18.0)	7 (4.7)	6 (4.0)
Journal articles	36 (24.0)	49 (32.7)	33 (22.0)	18 (12.0)	6 (4.0)	8 (5.3)
Clinical practice guidelines (CPG)	31 (20.7)	55 (36.7)	34 (22.7)	20 (13.3)	6 (4.0)	4 (2.7)
Online database (e.g., Cochrane)	45 (30.0)	38 (25.3)	38 (25.3)	12 (8.0)	10 (6.7)	7 (4.7)
Medical websites (e.g., Up To Date, Medscape)	47 (31.3)	40 (26.7)	32 (21.3)	23 (15.3)	4 (2.7)	4 (2.7)
General database (e.g., Google, Wikipedia)	88 (58.7)	36 (24.0)	14 (9.3)	7 (4.7)	4 (2.7)	1 (0.7)
Social media (e.g., WhatsApp, Facebook)	74 (49.3)	33 (22.0)	15 (10.0)	7 (4.7)	9 (6.0)	12 (8.0)
Medical apps (e.g., Epocrates, Medical Calculator)	33 (22.0)	36 (24.0)	20 (20.0)	16 (10.7)	21 (14.0)	14 (9.3)
Peers/colleagues	68 (45.3)	34 (22.7)	30 (20.0)	5 (3.3)	12 (8.0)	1 (0.7)

Figure 1 shows that more than one third of the studied participants (34.7%) looked for clinical information several times a week in the past year; this can be through textbooks, academic journal or online databases.

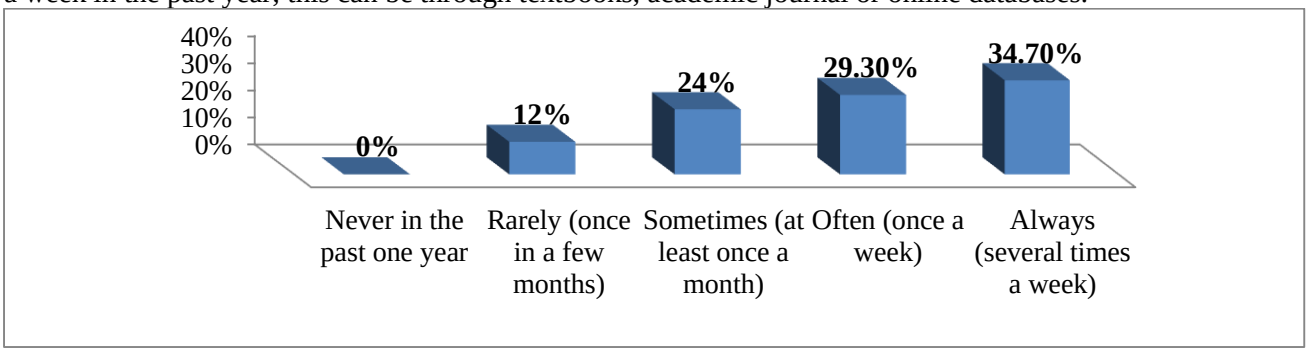

Figure (1): The frequency of looking for clinical information from medical literature (textbooks, academic journals or online databases) in the past one year (n=150).

Table 3 shows that the most known EBM resource by the studied participants was British Medical Journal (BMJ) (47.7%) and it was also the most read and utilized resource in clinical decision making (11.3%).

Table (3): Medical team participants' knowledge of EBM-specific sources of information (n=150).

Sources of information	Knowledge			
	Unaware	Aware but not used in clinical decision making	Have read it but not used in clinical decision making	Read and used in clinical decision making
	n (%)	n (%)	n (%)	n (%)
Bandolier (published in Oxford)	116 (77.3)	21 (14.0)	11 (7.3)	2 (1.3)
EBM from BMJ	79 (52.7)	32 (21.3)	22 (14.7)	17 (11.3)
DARE	91 (60.7)	28 (18.7)	23 (15.3)	8 (5.3)
CEBM	100 (66.7)	21 (14.0)	16 (10.7)	13 (8.7)
ACP Journal Club	98 (65.3)	25 (16.7)	17 (11.3)	10 (6.7)
BMJ Clinical Evidence	85 (56.7)	29 (19.3)	21 (14.0)	15 (10.0)
Info Clinics	99 (66.0)	31 (20.7)	10 (6.7)	10 (6.7)
Centre of Reviews and Dissertations	101 (67.3)	26 (17.3)	20 (13.3)	3 (2.0)

Table (4) shows that regarding knowledge of statistical terms; 48.7%, 44.7% and 40.7% of the studied participants understood well the following terms "case control study, randomized controlled trial and relative risk" respectively and were able to explain what it means to others.

Table (4): Medical team participants' knowledge of the statistical terms (n=150).

Statistical term	Never heard of this term before	Heard of this term but don't understand what it means	Do not understand this term but would like to	Have some understanding of this term	Understand this term well and able to explain what it means to others
	n (%)	n (%)	n (%)	n (%)	n (%)
Systematic review	15 (10)	17 (11.3)	10 (6.7)	62 (41.3)	46 (30.7)
Meta-analysis	10 (6.7)	18 (12.0)	16 (10.7)	58 (38.7)	48 (32.0)
Case-control study	4 (2.7)	10 (6.7)	8(5.3)	55(36.7)	73 (48.7)
Randomized controlled trial	7 (4.7)	5 (3.3)	8 (5.3)	63 (42.0)	67 (44.7)
Relative risk	8 (5.3)	7 (4.7)	19(12.7)	55 (36.7)	61 (40.7)
Absolute risk	9 (6.0)	7 (4.7)	18 (12.0)	64 (42.7)	52 (34.7)
Odds ratio	8 (5.3)	8 (5.3)	11 (7.3)	67 (44.7)	56 (37.3)
p-value	11 (7.3)	8 (5.3)	14 (9.3)	62 (41.3)	55 (36.7)
Confidence interval	19 (12.7)	14 (9.3)	28 (18.7)	53 (35.3)	36 (24.0)
Clinical effectiveness	12 (8.0)	13 (8.7)	35 (23.3)	52 (34.7)	38 (25.3)

Figure (2) shows attitude of studied participants regarding EBM, majority of the participants (88%) support EBM, (86.7%) agreed that "EBM improves their patient care" while (80.7%) of participants agreed that evidence based medicine reduces their workloads**.**

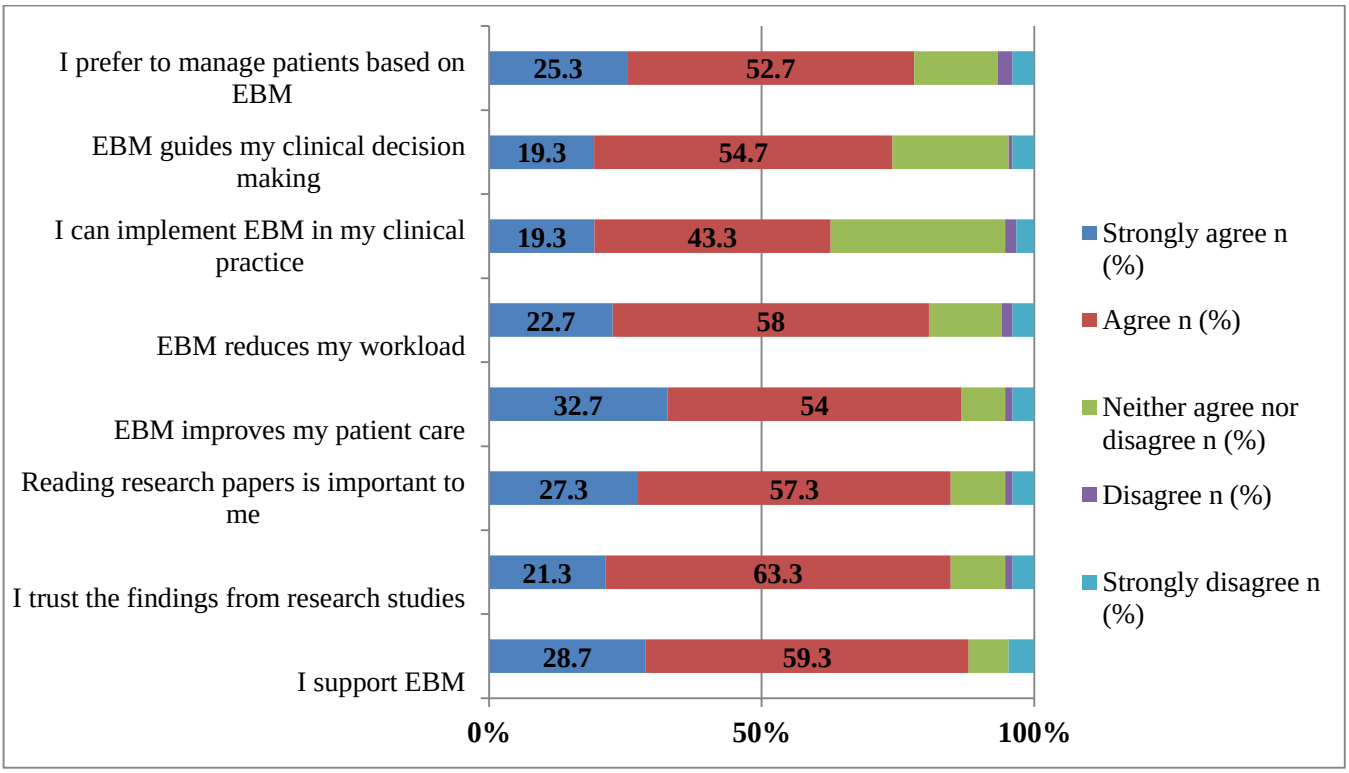

Figure (2): Attitude of the studied medical staff participants toward EBM (n=150).

According to table (5), about one half (52.7 percent) had fair knowledge, about one third of the participants (36.7%) had good knowledge and only (10.6%) had poor knowledge. There was a statistically significant relationship among "gender, current job position, department, years of experience, post graduate qualification and previous EBM training" and different knowledge categories.

Additionally, table (5) reveals that majority of the participants (91.3%) had positive attitude while (8.7%) had negative attitude. There was a statistically significant relationship among years of experience and attitude categories.

Table (5): Factors affecting knowledge and attitude scores among the studied medical staff participants (n=150)

Socio-demo-graphic characteristics	Knowledge levels			Statistical test value	P-value	Attitude levels		Statistical test value	P-value
	Poor knowledge n=16 (10.7%) n (%)	Fair knowledge n=79 (52.7%) n (%)	Good knowledge n=55 (36.7%) n (%)			Negative attitude n=13 (8.7%) n (%)	Positive attitude n=137 (91.3%) n (%)		
Age group									
25 – 28 years (n=40)	6 (15.0)	24 (60.0)	10 (25.0)	X^2=6.657	0.155	3(7.5)	37 (92.5)	LR=3.001	0.223
28 –31 years (n=61)	4 (6.6)	35(57.4)	22 (36.1)			3(4.9)	58 (95.1)		
31 – 35 years (n=49)	6 (12.2)	20 (40.8)	23 (46.9)			7(14.3)	42 (85.7)		
Gender									
Male (n=47)	10 (21.3)	21 (44.7)	16 (34.0)	X^2=8.181	0.017*	3 (6.4)	44 (93.6)	Fisher's exact =0.451	0.755
Female (n=103)	6 (5.8)	58 (56.3)	39 (37.9)			10 (9.7)	93 (90.3)		
Current position									
Resident doctor (n=55)	11 (20.0)	33 (60.0)	11 (20.0)	X^2=27.731	<0.001 **	5 (9.1)	50 (90.9)	LR=2.801	0.246
Demonstrator (n=36)	0 (0.0)	26 (72.2)	10 (27.8)			1 (2.8)	35 (97.2)		
Assistant lecturer (n=59)	5 (8.5)	20 (33.9)	34 (57.6)			7 (11.9)	52 (88.1)		
Department									
Academy (n= 43)	0 (0.0)	23 (53.5)	20 (46.5)	X^2=8.031	0.018*	6 (14.0)	37 (86.0)	X^2=2.129	0.144
Clinical (n=107)	16 (15.0)	56 (52.3)	35 (32.7)			7 (6.5)	100 (93.5)		
Years of experience									
≤7 years (n=90)	8 (8.9)	55 (61.1)	27 (30.0)	X^2=6.440	0.040*	4 (4.4)	86 (95.6)	X^2=5.067	0.024 *
>7 years (n=60)	8 (13.3)	24 (40.0)	28 (46.7)			9 (15.0)	51 (85.0)		
Postgraduate qualification									
No (n=75)	11 (14.7)	48 (64.0)	16 (21.3)	X^2=15.526	<0.001 **	6 (8.0)	69 (92.0)	X^2=0.084	0.772
Yes (n=75)	5 (6.7)	31 (41.3)	39 (52.0)			7 (9.3)	68 (90.7)		
Attended a course or workshop on EBM									
No (n=94)	11 (11.7)	56 (59.6)	27(28.7)	X^2=6.867	0.032*	10 (10.6)	84 (89.4)	Fisher's exact =1.237	0.373
Yes (n=56)	5 (8.9)	23 (41.1)	28 (50.0)			3 (5.4)	53 (94.6)		

*Statistical significance, P< 0.05, ** Highly statistical significance, P< 0.001, **LR** (likelihood ratio), **X^2** (Chi Square test).

Table (6) demonstrats that medical staff participants' department, current job position and previous EBM training were the statistically significant predictors for good knowledge. The medical staff participants who attended a course or workshop on EBM were approximately three times more likely to have good knowledge than medical staff participants who didn't attend previous training on EBM.

Table (6): Binary logistic regression model for predicting good knowledge determinants among medical team participants (n=150).

predictors	β	S.E.	X^2	Sig.	Adjusted OR	95% C.I. for OR	
						Lower	Upper
Gender							
Male [a]	-------	-------	-------	-------	-------	-------	-------
Female	0.239	0.461	0.269	0.604	1.270	0.514	3.137
Department							
Academic	1.164	0.545	4.559	0.033*	3.201	1.100	9.315
Clinical [a]	-------	-------	-------	-------	-------	-------	-------
Position			6.428	0.040*			
Resident doctor	-1.268-	0.767	2.732	0.098	0.281	0.063	1.266
Demonstrator	-1.856-	0.733	6.405	0.011*	0.156	0.037	0.658
Assistant lecturer [a]	-------	-------	-------	-------	-------	-------	-------
years of experience	-0.092-	0.102	0.805	0.370	0.912	0.747	1.115
Postgraduate qualification							
No [a]	-------	-------	-------	-------	-------	-------	-------
Yes	0.953	0.641	2.207	0.137	2.593	0.738	9.113
Attended a course or workshop on EBM							
No [a]	-------	-------	-------	-------	-------	-------	-------
Yes	1.072	0.405	6.998	0.008*	2.921	1.320	6.462
Constant	-0.544-	1.132	0.231	0.631	0.580		

* Statistical significance, P< 0.05, [a] = reference group, OR= Odds ratio; CI=Confidence Interval.

Figure (3) demonstrates the barriers and challenges faced by the medical staff participants during the process of EBM implementation in clinical practice. The most prevalent obstacles that the participants in this study agreed were time, clinic facilities and patient preferences and beliefs. About two thirds of the participants (64.7% and 62%) disagreed that "their clinic facilities were adequate to support the practice of EBM" and "they have time to practice EBM" respectively.

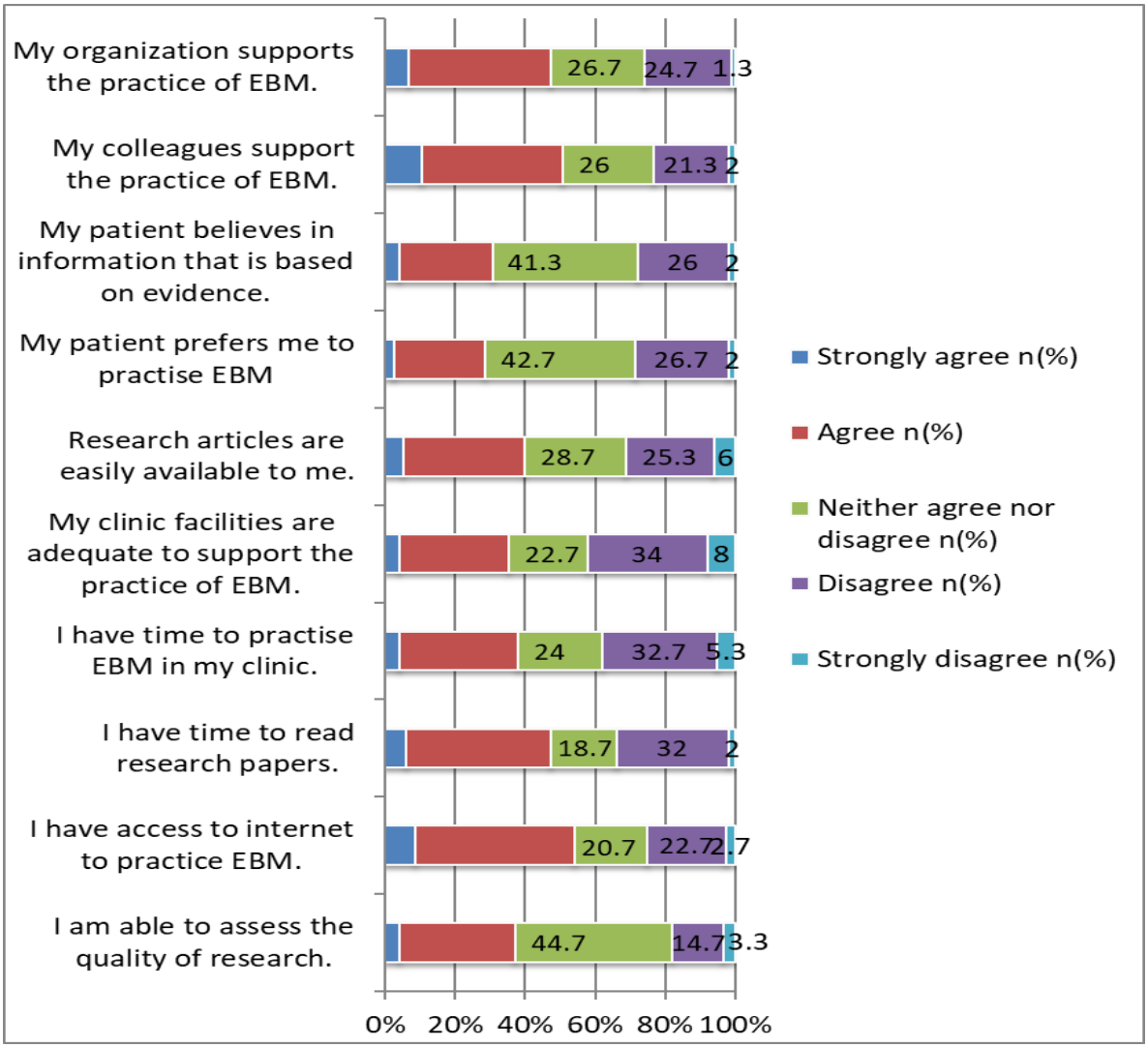

Figure (3): Barriers and facilitators of the medical team participants' practice of EBM (n=150).

DISCUSSION

The necessity for accountability and the public's increasing access to health-associated data make evidence-based practice an essential feature of both clinical practice and essential healthcare delivery [(16)]. Healthcare delivery depends on knowledge among healthcare providers [(17,18)]. In the context of Egypt, and specifically at the National Liver Institute, Menoufia University, the application of EBM principles becomes paramount as healthcare professionals navigate a landscape marked by evolving medical knowledge, technological advancements, and the growing importance of patient involvement in healthcare decisions. Understanding the current state of EBM knowledge, attitude, and the barriers faced by doctors in this institution is crucial for tailoring interventions that promote evidence-based practice and enhance the overall quality of healthcare delivery.

This study aims to delve into the perspectives of doctors at the National Liver Institute, assessing their EBM knowledge, exploring their attitudes towards its application in clinical practice, and identifying the barriers that may hinder the incorporation of evidence-based approaches. By shedding light on these aspects, we endeavor to contribute valuable insights that can inform targeted strategies to strengthen EBM competencies among healthcare professionals in this setting. The findings of this research show that doctors in NLI had favorable attitudes toward EBP and competent knowledge adequate to implement EBP.

Information sources usage: Regarding the use of information sources, all participants in this study were looking for clinical information from medical literature with different frequencies, only 34.67% always (several times a week) look for clinical information from medical literature, which could be textbooks, academic journals or online databases. Many participants always preferred general databases as Google and Wikipedia and social media tools such as WhatsApp and Facebook over textbooks and journal articles for information sources and over EBM specific sources of information. Social media is not a suitable clinical or scientific information source and it may provide inaccurate or faulty data. Similar results were reported by an Iranian study conducted by **Dabaghian *et al.*** in which participants rely on generic and medical databases, social media, textbooks, colleagues, and journal articles for information rather than EBM-specific sources. [(19)].

Awareness of different EBM resources

As regards to the participants' knowledge of different EBM resources, nearly half of the participants (47.3%) knew about EBM from BMJ. This result showed

a higher awareness regarding EBM from BMJ than the investigation of **Abd AL-Magied *et al.*** [12] (Menoufia Governorate, Egypt) and **Hassan *et al.*** [10] (Benha, Egypt) wherein just 28.6% and 27.3% of respondents, respectively, indicated knowledge of that resource [16,17] but unlikely it was lower than that obtained by **Al-Kubaisi *et al.*** [20] (Doha, Qatar), **Abdel-Kareem *et al.*** [9] (Tanta, Egypt) and **Dabaghian *et al.*** [19] (Iran), in which 69.2%, 60.5% and 60.1%, respectively reported awareness of that resource. Additionally, 11.3% of participants reported they have previously made decisions using EBM from BMJ. This was inconsistent with findings published in other studies, as the one carried out in the Islamic Republic of Iran by **Rashidbeygi and Sayehmiri**[21], Investigations by **Abdel-Kareem *et al.*** [9] and **Dabaghian *et al.*** [19] which reported that Evidence based medicine from BMJ publishing group was utilized by 8.5 percent, 5.5 percent, and two percent of participants, respectively, to aid in decision-making.

In the current investigation, 39.3 percent of medical staff participants were cognizant of the DARE (database of abstracts of reviews of effectiveness).

In contrast, **Dabaghian *et al.*** found that only 24.5 percent of the participants possessed this knowledge. This distinction may arise from the novelty of the term EBM within the Islamic Republic of Iran. [19]. However higher results obtained by **ALruwaili *et al.*** [16] (Saudi Arabia), which revealed that 49% of participants were aware of database of reviews and dissertations. This variance may be due to more than two thirds of the Saudi and non-Saudi participants (61.7%) attended training in EBM while in this study only (37.3%) of the participants attended previous EBM training. The current investigation found that 34.7 percent of the participants were cognizant of the ACP Journal, which stands in contrast to the finding of 22.5 percent in the research conducted by **Dabaghian *et al.*** [19].

Previous EBM training

Thirty-seven point three percent of the participants attended courses in EBM. This was inconsistent with the findings of **Alabdullah *et al.*** (Syria) in which 22.4 percent was the percentage [22]. This difference may be attributed to the condition of instability and war in Syria and can be due to the fact that evidence based medicine was one of the postgraduate elective courses in National Liver Institute.

This also differs from **Prabath *et al.*** (India) who reported only 21.6% of participants attending evidence based medicine courses [23] and **Boulos *et al.***(Ain Shams, Egypt) at 7.2% [11]. This difference may be attributed to those studies' participants who are freshly graduated residents with heavy workloads and less time to attend courses, particularly those not involved in their postgraduate study. A higher percentage was reported by **Abdel-Kareem *et al.*** in which 55.8% of participants attended previous EBM training [9]**.** This may be due to EBM is an integral part in both undergraduate and post-graduate curricula.

Regarding critical appraisal courses, 26.7% of our study participants reported attending them. **Dabaghian *et al.*** reported almost similar findings, with 25.5% of participants attending critical appraisal courses [19]. While **Abdel-Kareem *et al.* and Boulos *et al.*** showed lower results in which only 6.8 and 4% attended critical appraisal courses [9,11].

However, **Prabath *et al.*** reported a greater percentage of attendees (39.2%) in these courses [23]. This was potentially associated with the journal club presentation mandated by the Indian PG medical education curriculum. Recent studied in several nations have emphasized the necessity of including EBM skill training in undergraduate and postgraduate medical curricula [9,24].

Statistical terms awareness

Knowledge of statistical terms is mandatory to critically appraise research findings. which is essential for clinical decision-making [22]**.** Over all the participants demonstrated well understanding of the most frequently used statistical terms in EBM. This may be due to the medical statistics course offered to the doctors in NLI through post graduate curricula.

Regarding awareness of statistical terms related to EBM, about fifty percent of the participants stated that they could comprehend and clarify “case control study” (48.7%), “Randomized controlled trial” (44.7 percent) and “Relative risk” (40.7) to other colleagues. Conversely, lower than 1/3 of them could comprehend and clarify other terms, for example “systematic review” (30.7%), “clinical effectiveness” (25.3%), and “confidence interval” (24%). In a study carried out in Syria, **Alabdullah *et al.*** reported that a decrease proportion of physicians were familiar with the terms “relative risk” (11.7%), “systematic review” (10.3%), “Clinical effectiveness” (18.2%) and “confidence interval” (19.6%) [22]**.**

However, in a Kuwaiti study by **Qadhi *et al.***,a greater percentage of participants understood technical terms related to EBM [17]**.** The dissimilarities between the previously mentioned studies could be due to the availability of facilities to search literature, medical education curriculums and continuous training through workshops. In our study, the studied participants studied medical statistics course through master and MD programs but the lowest percentages may be because part of the participants were resident doctors who didn't get master yet and therefore didn't study the course.

EBM knowledge among studied participants

Regarding the participants' knowledge of evidence based medicine, the majority had fair level of knowledge (52.7%) followed by good level (36.7%) while a confined number of participants showed poor level of knowledge (10.6%). On the contrary, a study performed among emergency clinicians in Kelantan, Malaysia, revealed that a minority of the participants (49.7%) possessed a moderate level of knowledge (47.5%), while the majority (2.8%), possessed a low level of knowledge (twenty-eight percent) [24].

Furthermore, in a study conducted in Syria, only a minority of participants demonstrated a high level of knowledge, whereas the majority exhibited a low level. This difference could potentially be attributed to the impact of the political crisis and war in Syria on educational institutions and medical services. [22].

We found that medical staff participants' knowledge of evidence based medicine was significantly correlated with gender ($p = 0.017$), current job position ($p < 0.001$), department ($p=0.018$), years of experience ($p=0.040$), postgraduate qualification ($p < 0.001$) and attendance of a course or workshop on EBM ($p = 0.032$) and no significant relationship was found between age and EBM knowledge. These findings were nearly similar to an Egyptian study performed by **Abdel-Kareem *et al.***, which demonstrated that EBM knowledge significantly associated with current job position, specialty, previous qualification and previous EBM training [9]. In a study carried out in Kenya, **Unadkat *et al.*** found no significant correlation between age and EBM knowledge [25].

This is in contrast to what was found in a study of primary care physicians in northern Saudi Arabia, which found age to be significantly correlated with EBM knowledge. One potential area of distinction between their research and the present one may be the physician inclusion criteria. Our research involved resident physicians, demonstrators, and assistant lecturers, whereas their investigation was limited to primary care physicians [16].

Attitude toward EBM

It is essential for the healthcare workers to have a positive attitude, and it was found that better healthcare delivery is associated with positive attitude among healthcare workers [26,27]. The majority of the studied medical staff participants (91.3%) had a positive attitude toward Evidence based medicine. This is similar to the results reported by the studies conducted in Egypt [9], India[23], Singapore[25], Saudi Arabia[28], and Sri Lanka[29], which showed favorable attitude toward EBM. This is unlike to **Alabdullah *et al.*** study (Syria) [22]. In contrast to the prevailing neutrality demonstrated by the majority of residents under investigation, **Bin Briek *et al.*** [30] (Yemen) and **ALruwaili *et al*** [16]. (Saudi Arabia) observed clinicians who participated in their studies with suboptimal attitudes toward EBM. The possible causes for the significant differences in results across various areas include cultural factors, occupational environments, and EBM training requirements set by relevant health authorities [16].

Our substantial welcoming attitude may be due to the finding that around 86.7% of the studied participants believed that practicing evidence based medicine can improve cases health outcome. Also, over 80% of medical staff participants believed that practicing EBM can reduce their workload. Studies conducted among resident doctors from India [23] (80.4%), resident physicians from Egypt [9] (90%), and Kenya [25] and Japanese physicians [31] (sixty-five percent) also reported that EBM improved their patient care.

Barriers hindering the implementation of EBM

According to this study, the biggest obstacles to participants using evidence based medicine in their clinical practices were a lack of time and facilities. Other stated difficulties were patient beliefs and preferences. In spite of the availability of facilitator elements like Internet access, time is one of the major obstacles that study participants (62%) face when attempting to practice EBM. It was also clear from research participants' responses that just 28.7% of patients preferred EBM practice. As a result, patients also need to be educated about how EBM affects the quality of care. Different barriers were reported by studies conducted worldwide [32,33].

According to an Iranian study conducted by **Khammarnia *et al.*** their main obstacles are a lack of time and human resources [33]. Patients values, concerns, and expectations, inadequate EBM training, ambiguity regarding roles and practices, and workplace culture were identified as perceived barriers in a study conducted in Saudi Arabia by **ALruwaili *et al.*** [16]. According to a study done in Egypt, the main obstacles for study participants were lack of time, workload, and attitudes of colleagues (workplace culture) [9].

CONCLUSION

The most important finding was that physicians' attitudes regarding EBM were typically positive. Although low proportion of physicians received previous EBM training, the physicians' knowledge of EBM was outstanding. However, time constraints, inadequate resource and patient beliefs and preferences were the major barriers hindering their practice. Recognizing these limitations is crucial for developing interventions and training initiatives aimed at promoting an evidence-based practice culture within NLI Menoufia University.

DECLARATIONS

- **Consent for publication:** I confirm that all the authors have given their consent to submit the work.
- **Availability of data and material:** Available
- **Competing interests:** None
- **Funding:** No fund
- **Conflicts of interest:** No conflicts of interest.

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