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Knowledge, Attitude, and Practice of Evidence Based Medicine Among Doctors of a Tertiary Care Teaching Hospital in Gujarat, India: A Cross-Sectional Survey

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Abstract

Background & Objectives

Evidence-based medicine (EBM) emphasizes merging a physician's clinical expertise with the most reliable external evidence, aiming to minimize healthcare costs and offer optimal treatment choices for patients. This survey-based KAP study aimed to evaluate clinicians' knowledge, practice, and attitudes regarding EBM.

Materials & Methods

This cross-sectional questionnaire-based survey was conducted in April-May 2023 among clinicians and resident doctors working in Medical College Baroda and S.S.G Hospital. The questionnaire was sent via mail to the participants to assess the knowledge, attitude, and practice of EBM .

Results

The response rate was 82.35%. Over half of the participants (63%) showed positive attitude towards EBM, 29% were neutral, and 8% expressed a negative stance. 31.74% of clinicians demonstrated good EBM knowledge, while 68.25% had poor knowledge. Among prior EBM workshop attendees (19%), 66.66% had a good EBM knowledge level. Awareness of frequently used EBM resources was suboptimal, with PubMed leading the chart (39.6% used for clinical decisions; 32.5% for reading), followed by other databases like MEDLINE and EMBASE (31.7% were aware).

Conclusions

Past EBM workshop attendance significantly impacted clinicians' knowledge and practice scores, reflecting in their approach to Evidence-Based Practice. Although EBM has been around for a while, its evolving impact can be strengthened by integrating its principles into medical education programs.

Keywords: Attitude, Clinicians, Evidence-based medicine (EBM), Knowledge, Questionnaire, Survey

Introduction

It is essential to understand the knowledge, attitude, and practice of evidence-based medicine (EBM) among healthcare professionals, particularly doctors, to evaluate its effectiveness in various healthcare settings.

As the healthcare landscape in India continues to evolve, it is crucial to understand the factors influencing the adoption of evidence-based medicine among doctors. This will help to contribute to evidence-based healthcare, establishing a strong

connection between research and its practical application.

David Sackett defined Evidence-Based Medicine (EBM) as the "conscientious, explicit, and judicious use of current best evidence in making decisions about the care of individual patients." However, this definition only emphasized the importance of using research in clinical decision-making and failed to acknowledge the significance of the practitioner's knowledge and skills, as well as the patient's goals, values, and circumstances.[(1)]

The integration of these three components - best evidence, practitioner skills and knowledge, and patient's goals, values, and circumstances - comprises evidence-based practice. The ultimate goal of EBM is to improve the quality of care by promoting good practices and encouraging clinicians to try new scientific methods while abandoning ineffective ones.

To apply EBM in clinical practice, there are five main steps to follow:[1–3]

1. Define a clinically relevant question. (ASK)

2. Search for the best evidence. (AQUIRE)

3. Critically appraise the evidence. (APPRAISE)

4. Apply the evidence. (APPLY)

5. Evaluate the performance of EBM. (ASSESS)

Examining global perspectives on evidence-based medicine (EBM), a 1998 study among general practitioners in England revealed that only 40% were acquainted with the Cochrane Database of Systematic Reviews, a fundamental resource in the realm of EBM[4]. Further emphasizing the need for enhanced awareness, a recent 2022 study conducted among resident physicians in Syria reported a low level of familiarity with EBM resources and statistical terms. Resources such as Up To Date and PubMed emerged as the most recognized among residents[5].

EBM mandates clinicians to actively seek pertinent information to optimize patient care. Acknowledging its effectiveness, EBM has been shown to lead to cost-effective and superior healthcare outcomes.

This study has the objective of identifying the potential obstacles and level of awareness among clinicians regarding their knowledge, attitude, and practice of evidence-based medicine. The study provides valuable insights that can be used to inform policies, and educational and institutional strategies, with the ultimate goal of improving the quality of patient care in the region.

Materials And Methods

Study Design

A cross-sectional survey was conducted over 4 weeks in April-May 2023 at Medical College Baroda and Shree Sayajirao General Hospital, which has 1250 teaching beds across several clinical specialities and subspecialities with an annual average outdoor attendance of about 9 lakh patients, indoor admission of 67,000 patients and a bed occupancy rate of 90%. The approval for this research was obtained from the Institutional Ethics Committee for Biomedical and Health Research (IECBHR/187-2023), Medical College & S.S.G Hospital, Baroda, Gujarat.

The primary objective of this study was to comprehensively assess the Knowledge, Attitude, and Practice of Evidence-Based Medicine (EBM) among clinicians within a tertiary healthcare setting. Additionally, the research aimed to identify and delve into the various barriers hindering the effective implementation of EBM practices

Sample Size

Based on previous studies, it was assumed that around 90% of physicians welcome EBM in clinical practice, to achieve a minimum absolute precision of 5% and an alpha error of 5%, the study required a minimum of 139 participants. The sample size was calculated using the single proportion formula, and considering a non-response rate of 10%, the final sample size was determined to be 153.

Research Tool

The questionnaire was created using ideas from similar studies conducted in Malaysia and Romania[(6,7)], with a few modifications specific to our study's setting. To ensure its validity, the questionnaire was reviewed by a panel of 10 experts who were not involved in the main study. It comprised of 26 questions categorized into four sections. The first section collected socio-demographic information such as age, gender, academic qualifications, job position, and work experience. The subsequent sections focus on evaluating doctors' knowledge, attitudes, practices, and barriers related to Evidence-Based Medicine. The

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questionnaire was created using 'Google Forms'. The link for the same was sent via mail to 153 clinicians in different specialties. The components and scores assigned for evaluation of knowledge, attitude, and practice of EBM are summarized in Tables 1, 2, and 3 respectively.

Table 1 : Knowledge Components

Item	Description
K1	Familiarity with the concept of EBM
K2	Previous Attendance in any EBM course or workshop
K3	Identifying the best definition of EBM
K4	Knowledge about the "Hierarchy of Evidence"
K5	Knowledge about components of EBM Triad

Score: Answering correctly earns 1 point, while incorrect or unsure responses earn 0. Scores range from 0 to 5, with a mean calculated and divided into two categories: poor/low (2 or less) and good/high (above 2)

Table 2 : Attitude Components

Item	**Description**
A1	Attitude towards application of EBM in Clinical practice
A2	Reaction to finding evidence contradicting clinical judgement
A3	Patient participation in clinical decisions
A4	View on EBM devaluing clinical experience and intuition

Score: Responses showing a positive attitude earned a score of 1, and all other responses received a score of 0. The total attitude score ranged from 0 to 4, with >2 considered positive, =2 as neutral, and <2 as negative attitude.

Table 3 : Practice components and scoring

Item	**Description**
P1	Frequency of usage of EBM in Clinical practice— Regularly/occasionally got a score of 1 and don't use but heard about EBM/don't know about EBM got a score of 0.
P2	Rating of work setting by physicians based on availability of internet and use of current research on a scale of 1-10: ≥ 5 was scored 1
P3	Scoring for usage of information sources which had 6 items: Always (4), Often (3), sometimes (2), rarely (1), Never (0). Total score ranged from 0 to 24.
P4	Awareness/use of EBM resources like journals, review publications or databases: Unaware (0), aware but not used (1), Read (2), Used for clinical decision (3). Total score ranged between 0 to 15

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P5	Frequentness of reading medical journal was scored as—only occasionally (1), up to 1hour/week (2), 1-4hours/week (3), >4 hours/week (4).

Score: The total score ranged from 1 to 45. Scores were classified as either Poor (28 or lower) or Good (above 28) through mean score calculation.

Statistical Analysis

The data, after numerical coding, was entered into MS Excel 2021. The analysis was performed using Jamovi software, version 2.3.26. Descriptive statistics, such as numbers and percentages, were employed for qualitative data representation. The comparison of subcategories utilized the chi-square test, with a significance level set at $P < 0.05$.

Results

Of the 153 participants invited, 126 doctors (82.35%) actively participated. Sociodemographic profiles are outlined in Table 4, while Table 5 presents knowledge-related items and corresponding responses. Table 6 indicates that 31.74% demonstrated good/high knowledge, whereas 68.25% exhibited poor/low knowledge and delineates the factors influencing knowledge scores among the participants.

Table 4 : Sociodemographic characteristics of respondents

Characteristics	n.=126	%
Gender		
Male	60	47.61
Female	66	52.38
Age		
20-29	76	60.31
30-39	17	13.49
40-49	24	19.04
>/=50	9	7.14
Academic qualification		
Bachelor's degree (graduate)	77	61.11
Master's degree (post-graduate)	47	37.30
Post-Doctoral Degree (DM/MCh)	02	1.58
Job position		

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Consultant	16	12.69
Faculty	33	26.19
Medical Officer	02	1.58
Resident	75	59.52
Work Experience (in years)		
≤ 10	84	66.66
≥21	13	10.31
11-20	29	23.01

Table 5 : Knowledge Item with the percentage of responses

Item	**Description**	**Correct/yes n. (%)**	**Not sure/don't know/ maybe n. (%)**	**Wrong/no n. (%)**
K1*	**Familiarity with the concept of EBM**	108 (85.71)	11 (8.73)	7(5.56)
K2	**Previous Attendance in any EBM course or workshop**	24 (19)	-	102(81)
K3	**Identifying the best definition of EBM**	31 (24.6)	-	95(75.4)
K4	**Knowledge about the "Hierarchy of Evidence"**	87 (69.05)	-	39(30.95)
K5	**Knowledge about components of EBM Triad**	36 (28.57)	-	90 (71.42)

*Question which had Don't know/Maybe as one of the options

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Table 6 : Factors affecting the knowledge score of EBM among respondents

Variables	**Knowledge score**		**χ2**	***P***
	Good n. (%)	**Poor n. (%)**		
Gender			0.161	0.688
Male (n= 60)	18 (30)	42 (70)		
Female (n= 66)	22 (33.33)	44 (66.66)		
Age			4.09	0.252
20-29 (n=76)	23 (30.26)	53 (69.73)		
30-39 (n=17)	05 (29.41)	12 (70.58)		
40-49 (n=24)	11 (45.83)	13 (54.16)		
>/=50 (n=09)	01 (11.11)	08 (88.88)		
Job position			1.90	0.594
Consultant(n=16)	07(43.75)	09(56.25)		
Faculty(n=33)	11(33.33)	22(66.66)		
Medical Officer(n=02)	01(50)	01(50)		
Resident(n=75)	21(28)	54(72)		
Work Experience (in years)			4.05	0.132
≤ 10(n=84)	25(29.76)	59(70.23)		
≥21(n=13)	02(15.38)	11(84.61)		
11-20(n=29)	13(44.82)	16(55.17)		
Previous EBM Training			16.7	<0.001*
Yes (n=24)	16(66.66)	08(33.33)		
No (n = 102)	24(23.52)	78(76.47)		

*Statistically significant

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19% of clinicians had previous experience participating in workshops on EBM. Figure 1 illustrates the contrast in knowledge levels between doctors who had undergone prior EBM training and those who had not. According to our research findings, there is a significant and robust correlation between clinicians' knowledge and prior training in Evidence-Based Medicine ($p < 0.001$). However, no statistically significant correlation was identified between gender, job position, or years of work experience and the level of knowledge among the participants.

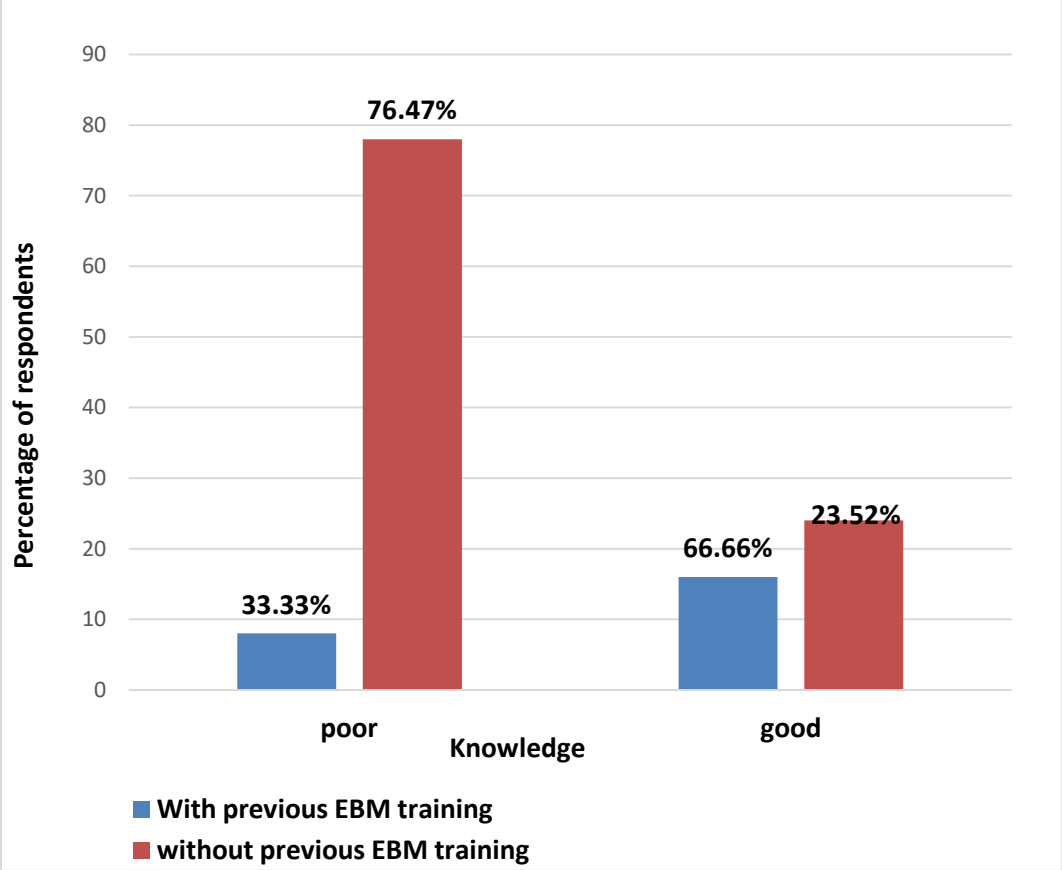

Figure 1 : Effect of prior EBM workshop attendance on knowledge level.

63% of doctors hold a positive attitude towards Evidence-Based Medicine (EBM). Only 8% of the doctors had a negative attitude towards EBM, while the remaining 29% chose to remain neutral. However, the study found no statistically significant correlation between attitude scores and factors such as age, gender, job position, work experience, or previous EBM training among the participants. In the survey, 89.68% of participants agreed that Evidence-Based Medicine (EBM) is necessary for clinical practice, while 9.5% were unsure. When presented with contradicting evidence, 79% of doctors said they would evaluate it, 14% would follow it, and only 2% would discard it**.** When asked if EBM devalues clinical experience and intuition, only 9% of respondents strongly disagreed, while 54% remained neutral (Figure 2). Furthermore, our study found that only 19% of doctors believed that patients should participate in clinical decision-making.

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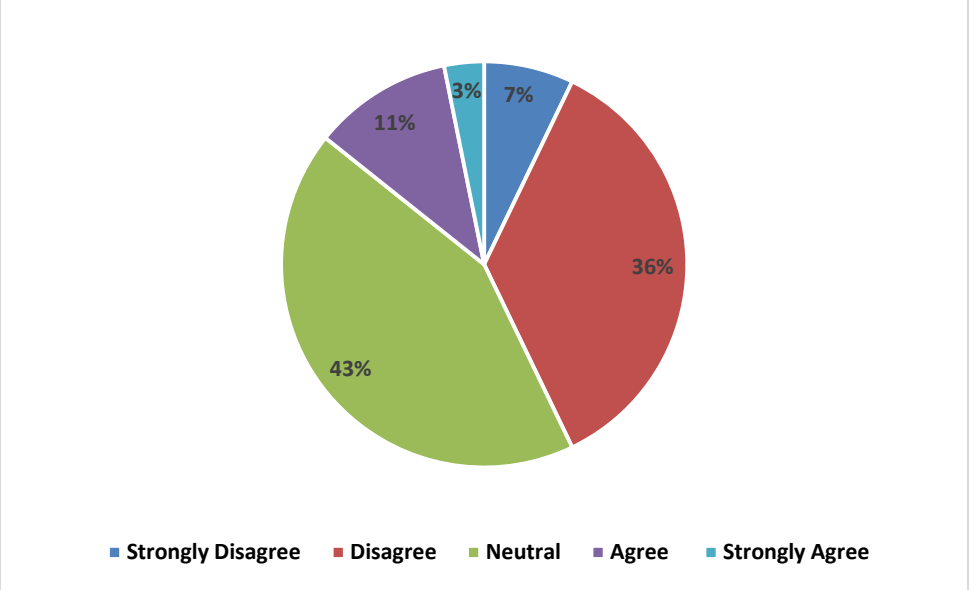

Figure 2 : Participants' reactions to whether EBM diminishes the value of clinical experience.

According to our survey, it was found that 61.11% of doctors rely on their clinical experience while treating patients, while 44.44% frequently refer to medical journals. Only 12% of respondents reported using Cochrane Collaboration reviews to guide their clinical decisions. Table 7 indicates that 56% of participants had good practice scores, while 44% had poor scores and previous EBM training significantly affected practice scores.

Table 7 : Factors affecting the practice score of EBM among respondents

Variables	**Practice Score**		$\chi 2$	***P***
	Good n.(%)	**Poor n.(%)**		
Gender			0.702	0.402
Male (n= 60)	31(51.66)	29 (48.33)		
Female (n= 66)	39 (59.09)	27 (40.90)		
Age			5.58	0.134
20-29 (n=76)	43 (56.57)	33 (43.42)		
30-39 (n=17)	06 (35.29)	11 (64.70)		
40-49 (n=24)	17 (70.83)	07 (29.16)		
>/=50 (n=09)	04 (44.44)	05 (55.55)		
Job position			1.76	0.623
Consultant(n=16)	07 (43.75)	09 (56.25)		
Faculty(n=33)	21 (63.63)	12 (36.36)		

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Medical Officer(n=02)	00 (0)	02 (100.00)		
Resident(n=75)	42 (56)	33 (44)		
Work Experience (in years)				
≤ 10(n=84)	44 (52.38)	40 (47.61)	1.52	0.467
≥21(n=13)	07 (53.84)	06 (46.15)		
11-20(n=29)	19 (65.51)	10 (34.48)		
Previous EBM Training			4.54	0.033*
Yes (n=24)	18 (75)	06 (25)		
No (n = 102)	52 (50.98)	50 (49.01)		

*Statistically significant

When questioned about the time allocated to reading medical journals, around one-third (33.33%) mentioned having time only occasionally, and only 16.66% reported dedicating more than four hours per week to this endeavour. The overall awareness of frequently used resources in Evidence-Based Medicine (EBM) was found to be suboptimal (Figure 3). A majority of participants demonstrated limited awareness of Bandolier (59.5%), and while 47.61% were aware of the Cochrane Database of Systematic Reviews, they did not utilize it. PubMed emerged as the most well-known resource (39.6% utilized in clinical decision-making; 32.5% for reading), followed by other medical databases such as MEDLINE and EMBASE (20.63% utilized in clinical decision-making; 30.95% for reading).

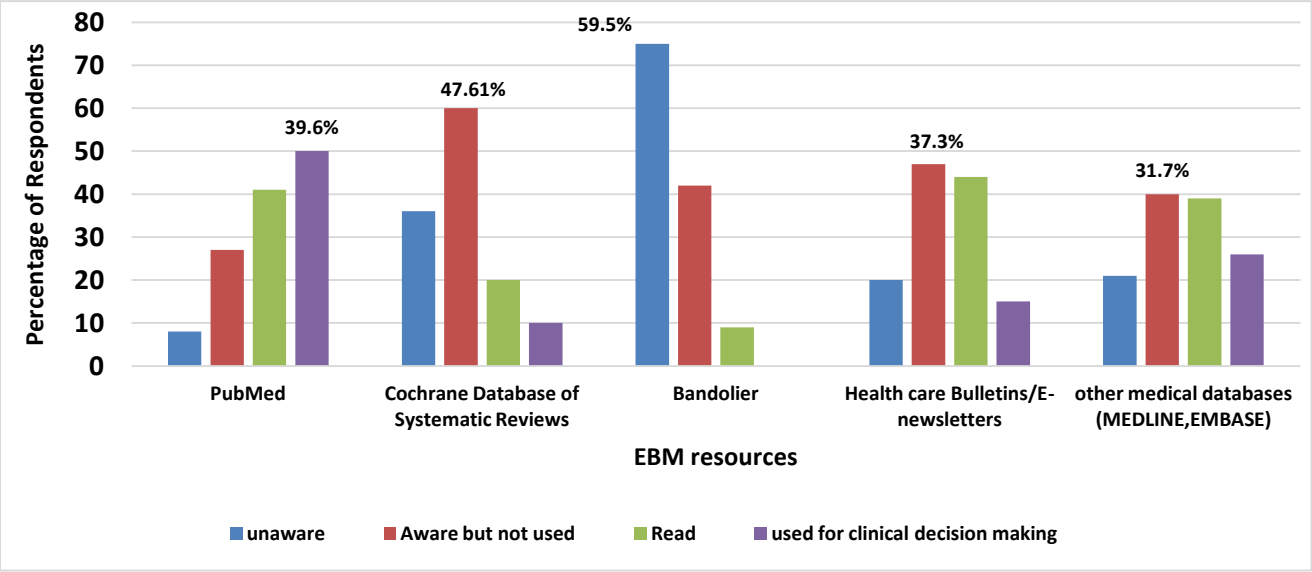

Figure 3 : Familiarity and usage pattern of EBM resources

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In our survey, we discovered a significant impact of participants' attitudes on their practice of Evidence-Based Medicine (EBM) ($p < 0.042$). Nevertheless, we did not observe any significant correlation between knowledge scores and practice, nor between knowledge scores and attitude scores. The study participants reported lack of time (37.30%) as the major barrier to Evidence-Based practice, followed by no ready access to EBM (19.04%) and threat to clinical freedom/judgment (12.69%). (Figure 4)

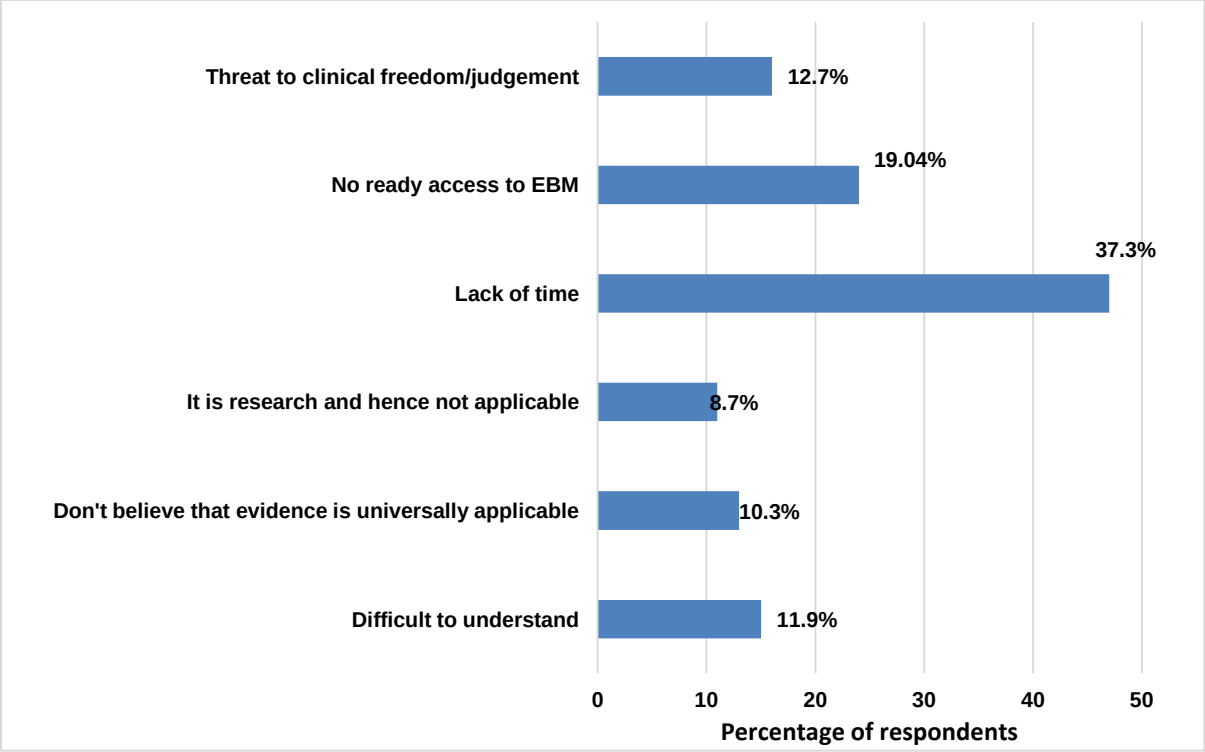

Figure 4 : Barriers to EBM practice.

Discussion

The study provides valuable insights into clinicians' knowledge, attitudes, and practices regarding Evidence-Based Medicine (EBM), including knowledge levels, familiarity with EBM sources, attitudes toward EBM promotion, and identified barriers to EBM practice. The most significant observation was the distribution of knowledge among the study participants. A notable 68.25% demonstrated poor knowledge, while only 31.74% exhibited good knowledge about EBM. This contrast in knowledge levels raises concerns about the understanding and application of evidence-based practices in the clinical setting. A comparison with similar studies conducted in Malaysia revealed a considerable disparity in knowledge levels, with only 2.8% and 6.2% of participants having poor knowledge respectively[8,9]. However, a study in Syria reported results quite similar to our study where over half of the participants(55.1%)had a low level of knowledge[5]. Targeted interventions are required to enhance EBM knowledge among healthcare professionals in our study population.

The study revealed a concerning lack of awareness of EBM Triad components. Only 28.6% of participants were aware of all three components, emphasizing the need for educational initiatives to familiarize healthcare professionals with the elements of EBM, including clinical expertise, credible scientific evidence, and consideration of patient values and preferences. A concerning discovery was that merely 24.6% of participants accurately recognized the definition of EBM. This contrasts starkly with the findings of a study among Romanian physicians, where the correct definition of EBM was identified by the majority of respondents (75.6%)[7]. Furthermore, 75% of participants erroneously believed that EBM focused solely on the best current available research without considering patient values. This misperception highlights the importance of clarifying the core principles of EBM. The study provided insights into the participants' grasp of the

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evidence hierarchy. Over 50% correctly recognized that meta-analysis holds a higher position than case-control and cohort studies. In contrast, another study reported that 42.2% of participants expressed uncertainty about whether a meta-analysis is superior to a case-control study[9].

While the majority of respondents expressed a positive attitude towards the promotion of EBM, a noteworthy 8% showed a negative attitude. Comparisons with other studies indicated that positive attitudes towards EBM were prevalent in healthcare settings of Egypt, Karnataka(India), and Japan emphasizing the need for a positive cultural shift towards evidence-based practices[6,10,11]. Encouragingly, a substantial 89.68% of respondents believed it is important to integrate EBM into clinical practice, aligning with findings from other studies[12–14]. This positive perception is a good sign for the potential success of interventions aimed at promoting EBM.

In terms of doctors' awareness of EBM sources, our study results closely align with a study conducted in Syria, indicating a significant lack of awareness of Bandolier. 44.4% were aware but not using the Cochrane database. Up To Date was the most recognized resource followed by PubMed[5]. According to a study conducted among Egyptian physicians, 61.3% of them reported using PubMed, followed by the Cochrane database (10.1%). The study also found that only 18% of participants regularly read medical journals, while 28.3% read them occasionally[6]. These findings are quite similar to our study, which reported that 16.66% of clinicians spend over 4 hours reading medical journals.

The current study reveals a robust correlation between prior EBM training and clinicians' knowledge and practice scores. A similar significant positive impact of EBM courses on knowledge scores among physicians in Egypt was reported ($p < 0.001$)[6]. These findings emphasize the effectiveness of training interventions in enhancing both understanding and application of EBM principles, while also highlighting the importance of a positive attitude in the successful implementation of EBM.

Barriers to EBM practice were identified, with lack of time being the most significant one, reported by 37.30% of participants. 19.04% cited a lack of ready access to EBM as a hindrance, emphasizing the need for improved information dissemination and accessibility. This barrier was consistent with findings from other studies in the Middle East(85.4%)[12] and Melaka(72.5%) [15].

The study has limitations, including reliance on a self-administered questionnaire for information on knowledge, attitude, and practice regarding EBM. Due to the clinicians' high workload, completing the questionnaire within a limited time may have introduced non-response bias. Negative attitudes correlated with poor practice, but social desirability bias could have influenced these results. Additionally, the self-rated assessment of knowledge and beliefs might have pressured participants, potentially leading to a reluctance to disclose knowledge and skill deficiencies, introducing social desirability bias.

Conclusion

Attending EBM workshops in the past had a noticeable impact on clinicians' knowledge and practice scores. Furthermore, the respondents' attitudes towards Evidence-based practice were reflected in their approach towards EBM practice. Our study highlights the need for targeted educational interventions to improve EBM knowledge, correct misperceptions, and overcome barriers to practice among healthcare professionals.

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