Perceptions, Attitude, Practices and Barriers to Evidence Based Medicine among Practitioners of Clinical Medicine in a Tertiary Care Teaching Institute, Punjab, India

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ABSTRACT

BACKGROUND

Lack or relative absence of access or disinterest in the use of standardised protocols in diagnosis, treatment and management of majority of ailments is a phenomenon very often seen but rarely acknowledged in the medical fraternity. This occurrence extends to many of the higher centers of healing and teaching including tertiary care institutes. We wanted to assess the perceptions, attitudes, practices and barriers to practice of evidence-based medicine among practitioners in clinical medicine in a tertiary care institute.

METHODS

A structured proforma containing Evidence Based Practice Questionnaire by Upton and Upton (2006) was administered to faculty members of various clinical specialties between July to September 2019. Non probability purposive sampling technique was used to enlist 50 participants who met the inclusion criteria. The completed proformas were collected and data was analysed using SPSS v.21. After analysing the data, in depth interviews of 16 consenting faculty members was conducted to identify barriers to practice of evidence-based medicine.

RESULTS

The mean score for knowledge domain of evidence based medicine was 53.18, SD = 7.05, for the attitude was 16.90, SD = 2.12 and that for practice was 20.50, SD = 5.26. The Cronbach alpha for the three domains were found to be 0.57, 0.62 and 0.81. The familiarity with common bio statistical terms and measures was best with odds ratio (78 %) and relative risk (64 %) and poorest with the understanding of parametric, non-parametric tests and power of the study (2 %). Of the 50 study subjects, 26 (52 %) used MS Excel for data analysis, 32 (64 %) generic search engines like Google, Yahoo, MSN to search for relevant medical literature. The thematic analysis of the interview transcripts of 16 interviewed faculty members revealed that barriers for non-practice of EBM were lack of comfort with research process, lack of mentoring, incomplete knowledge on how to conduct literature research and lack of time.

CONCLUSIONS

Practice of evidence based medicine has come a long way but still has a longer way to go.

KEYWORDS

Evidence Based Medicine, Barriers, Clinical Practitioners

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BACKGROUND

Evidence based medicine (EBM) was originally defined as the conscientious, explicit, and judicious use of current best evidence in making decisions about the care of individual patient.[1] The revised and improved definition of evidence-based medicine is a systematic approach to clinical problem solving which allows the integration of the best available research evidence with clinical expertise and patient values.[2]

In real life, medical practice is driven by three major factors; the presence of marked variation in treatments, the increasing cost of healthcare and the improvement in our ability to measure and analyze outcomes.[3] There always will exist some degree of subjectivity on the part of practitioners, experts, or administrators despite the availability of evidentiary support to clinical decision trees. Knowledge gap or biases can be overcome by the judicious use of formal, explicit methods to analyze evidence. But for that to happen, the knowledge gap has to be identified first. Also, the practice of evidence based medicine is a fact of clinical orientation of the practitioner, the extent and correctness of which varies from place to place and individual to individual.

A study conducted on directors of public health, clinical directors / consultants in hospitals, and general practitioners revealed some knowledge of selected evidence-based guidance, previous use, beliefs in quality, usefulness, and perceived influence on practice. It was found that 82 % of the respondents had consulted at least one source of evidence-based guidance in the past. Professional respondents in the health authorities responsible for directing or purchasing health policy (87 %) were significantly more likely than either hospital consultants (52 %) or GPs (57 %) to perceive any influence on change of practice emanating from the specified evidence-based sources.[4]

Another study conducted in North Mississippi health services (NMHS) program to improve physicians' clinical efficiency using evidence-based guidelines found its Medicare loss and its length of stay (LOS) reduced. Mortality and readmission rates were reduced in specific diagnoses. The community-acquired pneumonia project reduced the LOS from 7.7 to 5.1 days, decreased the mortality rate from 8.9 % to 5 %. In addition, the ischemic stroke project reduced the aspiration pneumonia rate from 6.4 % to 0 % and mortality from 11 % to 4.6 %. Patients' average LOS decreased from 10.7 days to 6.5 days, and their cost of care was reduced by $ 1,100 per patient.[5]

All these finding demonstrated that the implementation of EBM not only improved the health care offered to patients, but also reduced cost, making it more affordable. For this reason, the application of EBM in our countries would be most prudent as health cost and expenditure escalates daily outstripping financial resources.

Objectives

To determine the perceptions, attitude and practice of evidence based medicine among practitioners in clinical medicine and identify possible barriers for non-use or underuse of evidence based medicine.

METHODS

A cross sectional study was conducted from July to September 2019 after obtaining the ethical clearance from the institutional ethical committee vide letter no Patho 574 / 19 dated 31 / 07 / 2019 on clinical medical professionals working in Sri Guru Ram Das Institute of Medical Sciences and Research, Amritsar, Punjab, a leading teaching tertiary care hospital in North India. The sampling technique adopted was non probability purposive sampling. A pretested and validated proforma EBPQ by Upton and Upton was administered to the participants after taking their informed consent.[6] Confidentiality of the information was assured. Inclusion criteria of the participants was:

1. Practicing clinical medicine for at least 5 years after postgraduate degree.
2. Supervisors or co-supervisors of at least one post graduate student.

50 consultants who fulfilled the inclusion criteria were selected using non probability purposive sampling technique. The participants were asked to fill in the questionnaire which carried a total of 24 items which collected information on three domains i.e., knowledge, attitude and practices about the evidence based practice. There were 14 items in the knowledge subscale, 4 in the attitude subscale and 6 in the practice subscale. All the items were to be answered on a 7-point Likert scale with 1 being the worst negative attribute and 7 being the best positive attribute.

On the basis of results obtained, in depth interviews were conducted with 16 participants who consented to be interviewed to identify the possible reasons for non-use or underuse of evidence-based medicine in their clinical practice. The reflexive thematic analysis technique was used. Each participant interview lasted for 30 - 45 minutes in which attempt was made to elicit appropriate and adequate information about non-use or underuse of evidence based medicine in their clinical practice. The transcript of the interview was shared with the participant to vouch for the accuracy of transcription and to add any additional information which he wanted to share. Memo writing was used to record transcripts of the interviews. The copies of all memos were distributed to the authors to generate codes with highlighters. 14 codes were generated. They were the transferred to a big chart paper. The overlapping codes were combined and similar codes were condensed to a single code. In the end, 4 distinct themes could be identified from the related codes. There was no conflict of interest and no financial assistance was received for the conducting the study.

Statistical Analysis

The data was collected and statistically analyzed using SPSS v.21. Descriptive and inferential statistical tests were applied.

RESULTS

A total of 50 participants meeting the inclusion criteria were enrolled in the study after taking their informed consent. There were 37 (74 %) males and 13 (26 %) females. Most of the participants 19 (38 %) belonged to the age group of 40 - 49 years followed by 13 (26 %) in the age group of 50 - 59 years. Only 3 (0.2 %) were aged more than 70 years.

The participants were also grouped according to highest medical educational qualification received. The highest medical qualification of 47 (94 %) of the participants was post-graduation whereas of 03 (6 %) was super specialization. The teaching experience of 24 (48 %) study participants ranged from 10 - 19 years while 14 (28 %) had been teaching for 20 - 29 years. Only 5 (10 %) study subjects had teaching experience of less than 9 years.

The analysis of the data in the knowledge domain revealed best mean item score of 4.49 was obtained for being able to critically analyze the gathered information against set standards and mean item score of 4.20 was obtained in the ability to determine the usefulness of the gathered information. The poorest score of 3.32 was obtained on the item about awareness of major sources of information and its sources (Table 1).

The analysis of items in the attitude domain unveiled best score of 4.52 obtained on a reversely stated item about evidence based medicine being a waste of time. (Table 1).

In the practice domain, the best item mean of 4.28 was obtained for the item which asked about the ability to formulate a clearly answerable question as the beginning of the process towards filling this gap and the poorest item mean of 2.86 as obtained for actually performing critically appraisal against set criteria, any literature that had been specifically (Table 1).

The study subjects had a mean overall score of 53.18, SD = 7.05 in the knowledge domain, total mean of 16.90, SD = 2.12 in attitude domain and overall mean of 20.50, SD = 5.26 in the practice domain of evidence based medicine. The subscale exploring the knowledge domain had 14 items. Responses of clinical practitioners over these items on analysis yielded a Cronbach alpha was 0.57 which was lower than 0.6 value needed to make it a reliable tool in this study. The 4 item subscale for measuring attitude towards evidence based medicine passed a Cronbach alpha of 0.62 making it a more acceptable value for a good internal consistency in the questionnaire. The internal consistency of the 6 item practice subscale was the highest at 0.81 and the best achieved value in terms of scale reliability in this study population (Table 2)

The participants were asked to enlist in order of their preference, preferred search engine for locating pertinent medical literature. 32 (64 %) listed generic search engines like Google, Yahoo, Bing, Msn where they begin their search for relevant literature. Specific medical search engines like PubMed, Cochrane library, Scopus, Ovid were used by few 18 (36 %) as the starting point of search of medical evidence. Only 12 (24 %) searched standard textbooks and journals for answers to their queries.

While carrying out analysis of research data, most of the study participants 26 (52 %) used MS Excel, 14 (28 %) preferred the online statistical calculators for research calculations, 4 (08 %) listed SPSS as their statistical tool of choice, 2 (4 %) were most comfortable using Epi Info and 4 (08 %) used other soft wares. (Figure 1)

When confronted with a difficult non emergent clinical situation, majority 26 (52 %) of the practitioners preferred to consult a senior colleague, 10 (20 %) relied on their own personal previous experience, 8 (16 %) put the query in some professional forum and await feedback and just 6 (12 %) researched the medical literature. (Figure 2)

The participants when asked about familiarity and usage of common bio-statistical terms used in the interpretation of medical literature were more conversant with some terms than the others (Table 5). Close to half i.e. 21 (42 %) could comprehensively understand the concept of sample size determination whereas only 11 (22 %) could determine how appropriate sample size could be determined as did 7 (14 %) study subjects who could use the concept of design effect. The errors of false positive (alpha error) and false negative (beta error) associated with the statistical hypothesis testing was in the gray zone of understanding of the clinicians at 27 (54 %) and 25 (50 %). As far as the power of the study or research was concerned, a vast majority i.e. 32 (64 %) participants had just heard of the term. Measures of association like odds ratio and relative risk was known and used in research by 39 (78 %) and 32 (64 %) study subjects as was the concept of confidence interval which was used by 25 (50 %) study subjects. The level of significance P-value was understood comprehensively and used in research by 24 (48 %) and 26 (52 %) clinical practitioners.

During the qualitative research phase of the study, 16 consultants who gave their consent to be interviewed were subjected to in depth interviews. The common themes to be identified in order of frequency were:

1. Lack of comfort with research process: the participants were more comfortable to seek advice from their peers rather than doing research on the medical condition.
2. Lack of mentoring: were not sure of whom to approach for guidance
3. Incomplete knowledge on how to conduct literature research: not very conversant with the method to go about gathering pertinent medical literature
4. Lack of time: felt that they already were carrying heavy workloads and could not spare the time.

DISCUSSION

While it is a general consensus amongst the practitioners of clinical medicine that practice of evidence based medicine is the best way to translate health care literature to maximize health benefits to their patients, the theory does not often translate into action.

The findings of the current study are consistent with a study conducted in Saudi Arabia showed that 93.5 % respondents agreed that practicing EBM improved patient care, 38.5 % agreed that the best way to move from opinion-based medicine to EBM was through learning the skills of EBM. Although the respondents were aware and

demonstrated familiarity with the process of knowledge extraction procedures, as many as 40 % did not use them. The study concluded that while the attitude of most physician practitioners in this study is favorable toward EBM, but this was not correlated with knowledge and awareness.[7]

Search for relevant medical literature is the backbone of the practice of evidence based medicine. As the EBM includes the routine use of the best scientific evidences obtained by clinical research, they are actually impossible before electronic databases in the early 90's occurred. The advent of internet has revolutionized a lot of things including searching medical literature.[8]

There exist dedicated medical search engines and databases which are accessible with the click of a button. However, their use remains limited. Just 18 (36 %) of the participants in this study preferred to use medical search engines like PubMed in their bid to start a scientific query. For the majority 32 (64 %), the starting point was use of generic search engines like MSN, Bing, Google etc.

A study conducted in Canada showed that only a minority used EBM–related information sources such as research studies (45 %), clinical practice guidelines (27 %), and Cochrane collaboration reviews (5 %) on a regular basis. Less than half of the respondents were confident about the basic skills of EBM, such as, conducting a literature search (46 %) or evaluating the methodology of published studies (34 %).[9]

The electronic resources have become more important for healthcare professionals when searching for medical information. In the present study, only a small number of respondents i.e. 6 (12 %) searched medical literature either in print or electronic form while facing a non-emergent medical condition. However, a study conducted in Taiwan among medical professionals showed that electronic journals have replaced printed journals as the most commonly used resource when looking for medical information.[10]

A study conducted on family physicians and obstetricians more than half (51 %) consulted a respected authority when faced with a difficult clinical problem, (37 %) used traditional textbooks or clinical practice guidelines, while only (8 %) conducted Medline researches. Obstetricians used Medline more than family physicians. Although only 40 % considered EBM applicable, (88 %) expressed an interest in learning more about it.[11] Similar finding were found in the present study which showed that most of the participants 44 (88 %) relied on the advice of their peers or drew on their own previous experience.

As far as familiarity with bio statistical terms used in the interpretation of the research literature was concerned, most study subjects i.e. 39 (78 %) were aware of odds ratio, 32 (64 %) about relative risk. Many participants i.e. 21 (42 %) could not tell the types of statistical tests. Similar findings were observed in the study conducted among medical professionals in Saudi Arabia where most respondents were well-informed in basic concepts, such as, "P" values, study power, and case control studies while more than half had confidence in interpreting the results of scientific papers. Conversely, more than 67 % of the participants were not knowledgeable on more sophisticated terms in biostatistics.[12]

Knowledge about Evidence Based Medicine	Item Statistics Mean
1. Research skills	3.54
2. IT skills	3.52
3. Reviewing and monitoring of practical skills	3.44
4. Converting information needs to research question	3.76
5. Awareness of major information types and sources	3.32
6. Ability to identify major gaps in professional practice	3.80
7. Knowledge about how to retrieve material	4.24
8. Ability to critically analyse evidence against set standards	4.59
9. Ability to determine how valid evidence is	3.72
10. Ability to determine how useful material is	4.20
11. Ability to apply information to individual cases	3.98
12. Sharing of ideas and information with colleagues	3.88
13. Dissemination of new ideas and info with colleagues	3.49
14. Ability to review own practice	3.76
Attitude about Evidence Based Medicine	**Item Statistics Mean**
1. Workload is too great to keep up to date	3.54
2. Resent having clinical practice questioned	4.32
3. EBM is a waste of time	4.52
4. Stick to the tries and tested methods	4.21
Practice of Evidence Based Medicine	**Item Statistics Mean**
1. Formulated a clearly answerable question as the beginning of the process towards filling this gap	4.28
2. Tracked down the relevant evidence once you have formulated the question	3.26
3. Critically appraised, against set criteria, any literature you have discovered:	2.86
4. Integrated the evidence you have found with your expertise	4.21
5. Evaluated the outcomes of your practice	3.02
6. Shared this information with colleagues	2.87

Table 1. Distribution of the Study Subjects According to Knowledge, Attitude and Practice of Evidence Based Medicine

Name of Subscale	No of Items	Subscale Statistics Mean	SD	Range of Subscale Min	Range of Subscale Max	Cronbach Alpha
Knowledge	14	53.18	7.05	14	98	0.57
Attitude	4	16.90	2.12	4	28	0.62
Practice	6	20.50	5.26	6	42	0.81

Table 2. Subscale Statistics

Term	(1) No Idea	(2) Have Heard the Term	(3) Understand it Somewhat	(4) Comprehensively Understand	(5) Am Able to Use it in My Research
Sample size determination	01 (2 %)	03 (6 %)	14 (28 %)	21 (42 %)	11 (22 %)
Design effect	03 (6 %)	27 (54 %)	10 (20 %)	03 (06 %)	07 (14 %)
Alpha error	0	06 (12 %)	25 (50 %)	13 (26 %)	06 (12 %)
Beta error	0	01 (02 %)	27 (54 %)	17 (34 %)	05 (10 %)
Power of study	01 (2 %)	32 (64 %)	10 (20 %)	05 (10 %)	02 (04 %)
Odds ratio	0	0	03 (06 %)	08 (16 %)	39 (78 %)
Relative risk	0	0	07 (14 %)	11 (22 %)	32 (64 %)
Attributable risk	06 (12 %)	08 (16 %)	19 (38 %)	12 (24 %)	05 (10 %)
Confidence interval	0	0	13 (26 %)	12 (24 %)	25 (50 %)
Sensitivity & specificity of a test	0	0	28 (56 %)	13 (26 %)	09 (10 %)
Parametric &non parametric test	21 (42 %)	13 (26 %)	07 (14 %)	07 (14 %)	02 (04 %)
P-value	0	0	0	24 (48 %)	26 (52 %)

Table 3. Distribution of Study Subjects According to Familiarity with Basic Bio-Statistical Terms

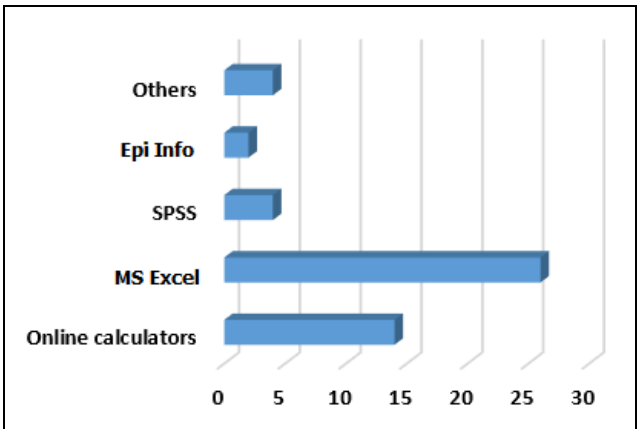

Figure 1. Distribution of Study Participants According to Software Preferred for Data Analysis

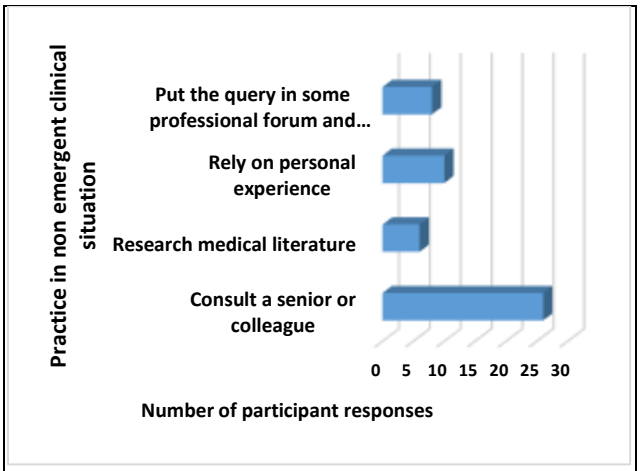

Figure 2. Distribution of Study Subjects According to Practice Adopted When Confronted with a Difficult Non Emergent Clinical Situation

CONCLUSIONS

The effort to practice evidence-based medicine is what the health care professionals engaged in direct management of health of the patients should aim for. They should try to inculcate the best evidence based practices in their day to day case management – be it preventive, promotive, curative, rehabilitative or palliative health service delivery. From being able to interpret the pertinent medical literature to designing a good research protocol all fall in the ambit of evidence based medicine. Evidence-based medicine practitioners engage in life-long learning and should be committed to the continuing education of professionals and patient communities. That will drastically cut down on the generic and arbitrary treatment protocols which usually prove detrimental to the doctor patient relationship.

Hence, the basic course in biomedical research offered by Indian Council of Medical Research and mandated by Board of Governors for Post graduate students and Medical Teachers seems a step in the right direction.

Data sharing statement provided by the authors is available with the full text of this article at jebmh.com.
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