

Evidence-Based Treatment, assisted by Mobile Technology to Deliver, and Evidence-Based Drugs in South Asian Countries

Ankita Wal¹, Madhusmruti Khandai², Himangi Vig¹, Parul Srivastava¹, Alka Agarwal³, Seema Wadhvani⁴, Pranay Wal^{1*}

¹Department of Pharmacy, Pranveer Singh Institute of Technology NH2 Kanpur Agra Highway, Kanpur, Uttar Pradesh, India.

²Department of Pharmacy, Royal College of Pharmacy and Health Sciences, Berhampur, Odisha, India. ³Department of Pharmacy, U.S Ostwal Institute of Pharmacy Mangalwad Chittorgar, Rajasthan, India. ⁴Department of Pharmacy, Sunrise College of Pharmacy Udaipur, India.

Abstract

Individual clinical experience is combined with the best possible external clinical data from systematic research in the practice of evidence-based medicine. Data-based treatment is a complete approach to treating healthcare problems that allow the best available research evidence to be combined with clinical experience and patient choices. Evidence-based medicine's obligations to the medical industry and allied areas in terms of creating a platform for integrating research findings into healthcare delivery and raising awareness of the need to take individual patient preferences into account. In terms of culture and medical practice, South Asian countries are different. This region has little understanding of evidence-based medicine. Evidence-based medications have been adopted in some parts of South Asia, according to multiple survey data, while it is yet unknown in others. Treatments for mobile phones are fast expanding, and a preliminary study indicates that South Asian countries could benefit from this technology as well. People can benefit from digital healthcare initiatives in a variety of ways, including improved skill-training opportunities in real-world situations, continual assistance from medical practitioners, and better drug management. Evidence-based medications will become more accessible and successful as a result of the combination of Evidence-based medications with mobile technologies. It will also allow for a timelier deployment of Evidence-based medications.

Keywords: Evidence-based medications, South asian countries, Mobile technology, Digital healthcare

INTRODUCTION

Over the last three centuries, calls for the profession of medicine to be based on scientifically reliable empirical facts have become louder [1]. Medicine has battled since Hippocrates to reconcile healers' uncontrolled experiences with findings gathered via thorough research of claims about the effectiveness of health therapies. With the enactment of the US Food and Drug Administration's Kefauver-Harris Act in 1962, robust empirical analysis of human clinical trials became lawfully needed to support drug efficacy assertions [2]. Even though regulations have changed, clinical trials are still needed to prove that new pharmaceutical inventions are safe and work. The term "evidence-based medicine" (EBM) was created in 1991 to teach front-line doctors how to judge the reliability of research data, understand the results of clinical studies, and decide how best to use the results in their daily work [3]. Practitioners of evidence-based treatment describe it as the conscious, explicit, and prudent use of current best evidence in making choices regarding patient-centered care [4]. The personalized treatment experience is combined with a critical evaluation of the best possible external clinical data from the scientific investigation in the practice of evidence-based medicine. Personalized treatment skill refers to the knowledge and judgment that physicians get

from their clinical practice and experience. The notion of EBM has attracted the attention of medical practitioners over the last decade. The proper implementation of EBM enabled a break from the centuries-old empiric practice that had controlled medical history. With several exemptions, EBM is widely considered the "gold standard" for medical expertise [5].

Evidence-based treatment is a comprehensive procedure for healthcare problem-solving that permits the merging of the best available research evidence with clinical expertise and

Address for correspondence: Pranay Wal, Department of Pharmacy, Pranveer Singh Institute of Technology NH2 Kanpur Agra Highway, Kanpur, Uttar Pradesh, India. pranaywal@gmail.com

This is an open-access article distributed under the terms of the Creative Commons Attribution-Non Commercial-Share Alike 4.0 License, which allows others to remix, tweak, and build upon the work non commercially, as long as the author is credited and the new creations are licensed under the identical terms.

How to cite this article: Wal A, Khandai M, Vig H, Srivastava P, Agarwal A, Wadhvani S, et al. Evidence-based Treatment, Assisted by Mobile Technology to Deliver, and Evidence-based Drugs in South Asian Countries. Arch Pharm Pract. 2022;13(4):63-73. <https://doi.org/10.51847/D5zEaJVK6X>

patient preferences, according to updated and enhanced terminology. We considered the competence and expertise that doctors develop over years of clinical practice in individualized clinical situations, and that medical training is a crucial and essential part of what makes a successful doctor. Evidence-based medicine is a permanent, self-directed, issue-directed process of learning wherein the necessity for clinically essential information concerning assessment, prognosis, treatment, and other therapeutic and healthcare concerns arises from treating one's clients. The concept of evidence-based medicine suggests a link between medical data, philosophy, and practice. However, EBM has evolved as a cohesive heuristic framework for improving medical practice, which clearly and conscientiously refers to the structure of clinical evidence rather than offering a new scientific hypothesis of clinical experience [6, 7]. According to EBM theory, whatever is justified or rational to believe is dependent on the reliability of the evidence and the extent to which one feels the information is produced by trustworthy methods. The second assumption supports the philosophic viewpoint that the best way to find out the truth is to evaluate all of the evidence rather than cherry-picking data that supports a certain assertion. Evidence is not enough on its own for better decision-making, which must consider the repercussions that are important to the decision-maker in the specific context and environment. So, EBM's last epistemic premise is that clinical decisions must take each person's preferences and values into account [8].

Evidence-based medications are most commonly viewed as extrinsic data relative to average clinical outcome [9], which can be converted into standards derived from multiple research with diverse demographics in care circumstances that do not always fit doctors'. Worldwide data may or may not be appropriate for a clinician's clients or the circumstances wherein they practice. Local knowledge and proof originate from genuine medical encounters serving specific patients in particular lanes; noting the precise treatment regimen, and the patients' living surroundings that

influence compliance, and health outcomes. Personalized treatment experience and the best possible external evidence are both used by good clinicians, but neither is sufficient. Lack of clinical knowledge and evidence may tyrannize practice because even strong external evidence might well be utterly irrelevant to or unsuitable for a particular patient. Without the most up-to-date evidence, practice risks becoming obsolete quickly, to the disadvantage of patients. One of the biggest myths regarding evidence-based medicine is that it would devolve into a "cookbook" treatment. It cannot, therefore, lead to rigid, "cook-book" methods for patient-centered care since it demands a bottom-up strategy that incorporates the finest empirical shreds of evidence with personalized treatment skills and patient choice. Any external guideline must be evaluated in conjunction with personalized treatment competence to determine whether and how it corresponds to the patient's clinical status, dilemma, and preferences, and thus if it should be implemented [10].

Medical demography and evaluation have spawned various specialties, including evidence-based medicine. In other healthcare settings, parallel advancements are taking place, all with the particular patient as the center of attention. Several evidence-based professions place a greater emphasis on society than on the particular patient or include an explicit economic component by attempting to acquire or offer a healthcare combination that will maximize some collective or social advantage. Evidence-based medication is neither a relic of the past nor an impossibility to implement. The claim that "everyone is already doing it" isn't true because there are big differences in how often doctors use patient preferences in their work and how often they give therapies to their patients [11, 12]. The practice of EBM is a life-long journey, a self-directed aspect of learning wherein the necessity for clinically essential information concerning assessment, prognosis, medication, as well as other medical and healthcare issues arises from caring for our individuals, which includes the following **Figure 1**.

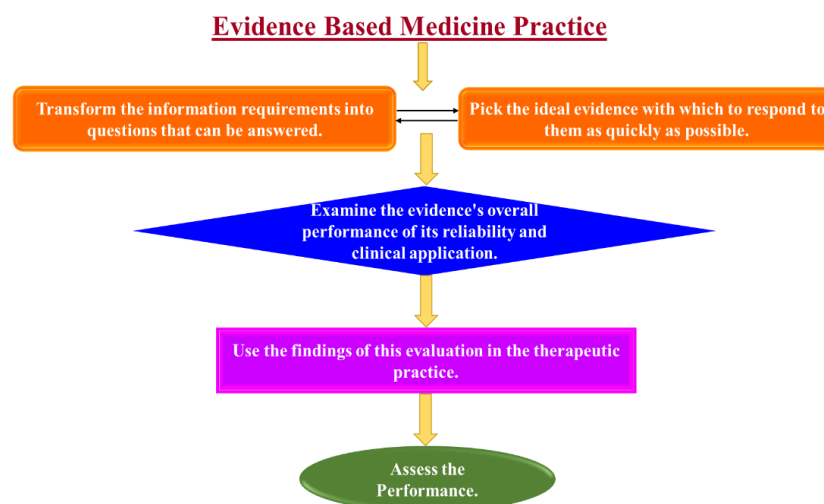


Figure 1. Stepwise description of the Evidence-Based Medicine Practice.

Clinical Practice Guidelines

The physician in evidence-based clinical practice "takes the best available evidence, in cooperation with the person, to choose the alternative that best matches that patient" [12]. It brings findings from population research to individual care, demonstrating a direct correlation to epidemiology [13]. The main difference between these ideas seems to be whether or not the patient is involved in making decisions about therapy.

In 1990, the Institute of Medicine (IOM) of the National Academy of Sciences defined Clinical Practice Guidelines (CPGs) as "systematically developed recommendations to help clinicians and patients make important decisions about patient care for certain clinical conditions" [14, 15]. The IOM guidelines advisory panels created clear standards for appraising the appropriateness of practice guidelines. Validity was seen as one of the most important qualities, and it was described in terms of 1: health and cost outcomes and 2: the degree to which clinical advice and the scientific evidence used to make the guidelines match up.

As such, CPGs serve as a foundation for 1: increasing knowledge by making practitioners conscious of suggestions; 2: adjusting mindsets toward quality care; 3: shifting procedures; and, 4: positive patient safety. They could become an effective way for doctors, especially generalists, to keep up with discoveries if the recommendations are written with the most up-to-date information and are assessed and updated regularly. Clinical Practice Guidelines can also be used to inform healthcare managers and commissioning bodies about which health initiatives are acceptable and which are not. People also think that practice recommendations are useful when it comes to the law, making patients and the public more aware, and deciding what research needs to be done first [16, 17].

EBM Practice Guidelines

For generations, practice guidelines—official pronouncements from organizations and agencies about the acceptable use of procedures and treatments—have weighed these issues in informal ways. A panel of specialists gathers around a conference table and is requested to submit suggestions based on their knowledge of the evidence and their personal opinions. There is no formal approach to examining evidence or reaching a consensus. Whatever methodologies and reasoning are employed are rarely included in the final draft. Even though formal consensus-building processes have been used, most notably at the National Institutes of Health Consensus Development Conferences and the Rand appropriateness panels, the panelists still make decisions based on their own opinions [18, 19].

Many organizations have shifted to EBM for the formulation of guidelines. Evidence-based practice guidelines have a clear method, a thorough look at the evidence that supports them, graded suggestions that link back to the evidence that

backs them up, and they make it clear when advice is based on opinion.

Generally, evidence-based practice guidelines come from six processes that, depending on the issue, are carried out with various intensities and in various patterns **Figure 2**.

Subject Matter and Methodology: An evidence model can often assist in clarifying the connections in the explanatory framework for which evidence is needed [20]. The very first stage is to define the review's emphasis, including the target disease, the interventions to be evaluated, critical clinical demographics and medical settings, and significant treatment outcomes. The search's parameters, such as library databases and exclusion criteria, are also established.

Critical and Systemic Evaluation: Evidence is reviewed according to protocols that have become more standardized in recent decades [21]. The first of three basic procedures is to conduct a systematic literature survey, utilizing explicitly stated search queries and other strategies to ensure that the required information has been acquired for reviewers and readers. Second, critical evaluation of individual research, including the use of clear analytic methods to assess internal and external validity, as well as the documentation of data in abstracted formats and evidence tables. Finally, there is also the integration of results, which involves describing the findings in narrative prose, evidence charts, or balance sheets. In the last step, evidence can be combined quantitatively in meta-analyses to measure the size of the overall effect.

Internal validity is measured by looking at a set of things, such as the sample population, how people are put into groups, interventions, outcome measures, dropout rates, and statistical measurements [22]. External validity is found by thinking about how the sample population, interventions, and environment are representative of the whole.

Expert Consultation: In all practical recommendations, expert input is considered. Even when evidence is provided, personal conclusions could be drawn when evaluating the evidence's strength or generalization, as well as when balancing the advantages and harms. When there is a dearth of evidence, groups differ in their willingness to offer suggestions based on personal opinions. When perspective is used in EBM, it is important to be clear about it so that people can understand why the recommendations were made and decide for themselves if they are correct.

Considerations in Public Policy: Policymakers must often evaluate the cost-effectiveness or cost-utilization of treatments in an era with constrained medical resources. Accessibility to care, availability of skilled personnel and innovation, insurance plans, and medicolegal consequences are all taken into account to varying degrees based on the

subject and panel ideology. Potential conflicts among panelists become particularly difficult in this situation [23]. Some groups never make suggestions based on their own opinions. Instead, they say that there isn't enough information to make a suggestion.

Document Preparation: In practice, guidelines and the language of recommendations are given a lot of thought because even minor differences in terminology can have important policy implications and alter the quality of patient treatment. The utilization of letter codes or suggestion classifications to signify how vigorously the intervention is suggested is a feature of evidence-based guidelines. Almost always, the quality of supporting evidence is reflected in this grading structure. The optimum alternative for interventions with complicated tradeoffs or ambiguous data may be determined by the values patients attach to prospective benefits and hazards. Guidelines for these kinds of things are moving away from giving general advice and instead telling clinicians to help patients assess and weigh their preferences as part of a joint decision-making process [24]. This approach entails discussing with individuals the possible advantages and risks of interventions, as well as their likelihood; assisting them in identifying how firmly they feel about possible outcomes, and deciding which choice is best based on this knowledge.

Evaluation by Peers: Evidence-based guidelines are frequently shared in written format with content experts to gain comment on the comprehensiveness of the review and the accuracy of the critical assessment, much like any other academic paper. The draft is also sent to stakeholders for responses, such as applicable professional groups and advocacy groups.

Evidence-based Medicine's Challenges

Evidence-based medicine has grown swiftly into a vibrant intellectual community dedicated to improving clinical practice by rendering it more scientifically and empirically oriented, resulting in healthier, more reliable, and cost-effective care [25]. Evidence-based medicine has had a lot of success over the last two decades, thanks to a lot of investment and enthusiasm. Notwithstanding numerous achievements, there is still a lot of variance in how evidence-based practice is implemented. The task of learning more about the foundations of our health in more depth can be daunting, and there are numerous potential dangers. With personalized medicine, you should be careful not to oversell and make sure that any claims you hear are backed up by evidence.

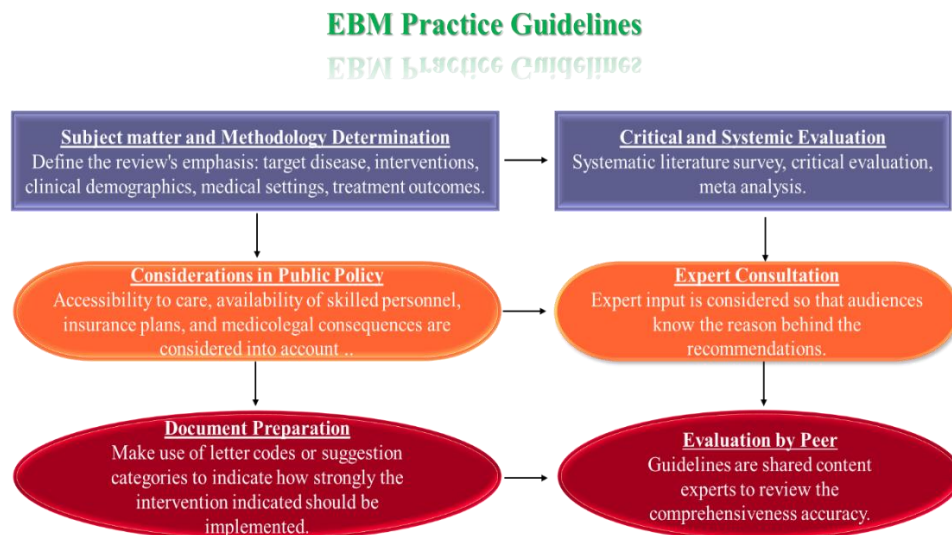


Figure 2. Overview of EBM practice guidelines.

No other health sector has ever developed at such a breakneck pace. As a result, this has repercussions that will undoubtedly affect many parts of the medical field. Because of the overall ideals and warm appreciation for EBM proponents, but concern about its existing procedures, based on what is performed according to what is promised. And it may be necessary to revisit and modify educational programs regularly to reflect the current, but ever-changing, state-of-the-art of targeted therapy. Given the probable future involving citizens in self-management of healthcare as a component of targeted therapy, it's also critical to devote

sufficient time and resources to promoting awareness of individual health and keeping people informed about the state of the field and how to best profit from it. Keeping the public sector up to date on the latest developments is a huge but vital task. The public needs to be an active part of this process of change, not just a passive observer.

The issues that the EBM faces are listed below.

Originality

The discrepancy seen between the contents of EBM and the application of EBM in medical care has been a primary cause of confusion. The materials are similar to a medical textbook, whereas the practice is just what happens when doctors make and follow patient-care procedures. Evidence-based medications, according to many professionals, are "hardly anything original." The originality lies in the substance of what is effectively a new form of clinical medicine textbook, rather than in the proposed practice of EBM. This uniqueness is hinted at by the fact that EBM uses "the best possible external medical evidence from systematic research" [26]. When the details of this clue are fleshed out, it's clear that it points to a narrow focus.

The Evidence's Composition

Despite the large amount of data that can be used in EBM, the evidence for EBM is nearly entirely based on randomized clinical trials and the meta-analyses that are conducted using those studies. Since meta-analyses may gather and evaluate data but not modify it, RCTs have now become the primary source to analyze data integrity and spectrum, as well as the extent of topics included in EBM collections.

Data Accuracy and Scope

Randomized clinical trials have focused on gathering "hard" statistics about mortality, sickness, and demographic trends to gain "trustworthy" knowledge. Before treatment, the patient's baseline status is routinely assessed using "reliable" data such as age, gender, ethnicity, MRI, endoscopy, histology, cytology, and laboratory investigations. When it's relevant, the outcome of therapy is written as "death" or as a global rating for typical symptoms that don't need to be described in more detail because "double-blind" observations should help avoid bias.

The failure resulted from the evidence collected in randomized controlled trials (RCTs). It is frequently inserted into meta-analyses without even being quality-checked first. Aside from omitting serious symptoms and other therapeutic factors that help distinguish these groupings, randomized-trial data frequently omits clinical subtleties that are critical for several other clinical options. The trial's conception and execution may also be overlooked at times [27, 28]. Many RCTs that have been intellectually inadequate notwithstanding their "gold standard" designation have been noted by practitioners of meta-analysis. Although strict criteria might be used to select only the truly "golden" RCTs [29, 30].

Misrepresented Evidence-Based Brand

The issue is that entrenched interests have stolen and twisted the evidence-based "quality mark." The pharmaceutical and healthcare businesses, in particular, are increasingly dictating research priorities. They specify what constitutes "risk states" for disease and disease. Evidence-based therapy may not be able to find the subtle biases that are becoming more common in sector investigations by using validity assessments and risk of bias methods [31].

An Enormous Amount of Evidence

The huge amount of evidence accessible is the next facet of the evidence-based medicine issue. The number of treatment guidelines, in particular, is currently unmanageable and illogical.

Co-Morbidity

As the population is aging and the occurrence of severe degenerative diseases rises, the individual with a single diagnosis that maps easily to a particular evidence-based recommendation is becoming increasingly rare. Even when relevant studies are planned to cover people with a variety of illnesses, adapting the results to patients with specific comorbidities is difficult. Comorbidity affects each individual differently and appears to defy attempts to create or apply objective ratings, metrics, treatments, or guidelines [32]. Care that is based on evidence for one illness or dangerous condition is causing or making another worse. This is especially true for the dangers of polypharmacy in the elderly.

Progress in the Status of Evidence-Based Medicine

The fundamental principles of EBM have been widely shared: an increasingly complex pyramid of evidence, the necessity for methodical descriptions of the strongest evidence to assist care; and the necessity for taking patient values into account when making important clinical choices. Several similar activities have benefited from, and possibly been spawned by, EBM. These measures have included an emphasis on comparative research on the effectiveness [33] over or under assessment and treatment [34], quality-of-care measurements [35], enhancing publication standards [36], guaranteeing that all investigations are registered [37, 38], and minimizing waste in research production, such as the discontinuation of misdirected initiatives, which have become standard practice. These tasks can be accomplished under the broad scope of the EBM motion, which has enlarged to include fields of study such as midwifery, dental care, health policy, and public health, and there is a need for evidence-based scientific research to ensure that clinics, healthcare facilities, and medical institutions function optimally [39].

Evidence-based medication's commitments to the medical field and related areas in terms of establishing a platform for integrating research findings into the provision of health care [40] and boosting awareness of the importance of considering individual patient preferences and values will be long-lasting.

Evidence-Based Medicine's Special Relationship with South Asian Countries

South Asian countries, despite their differences in geography, linguistics, and political institutions, suffer from similar health concerns. Most people are dealing with a triple burden: persistent communicable diseases, worsening chronic

disorders, and a rising number of accidents. HIV/AIDS, rapid urbanization that wasn't planned for, and several other factors that affect health make the situation worse [41]. Another common feature is that national medical figures conceal significant differences between countries [42, 43]. The health statistics in Asia's southern areas are among the worst worldwide. It has the highest rate of malnutrition and high blood sugar in the world. It also has 40% of the world's tuberculosis cases, a high rate of heart disease, and one of the worst measures of reproductive health [44]. Resource constraints, poor infrastructure, no universal healthcare plans, and a high illness load define health systems throughout the territory. Medical systems all around the region are also dealing with issues like a shortage of evidence-based policies and an absence of community responsibility. People incur hefty out-of-pocket expenses on top of other socioeconomic implications of ill health since there are no or inadequate national health care plans and private enterprise plays such a large role [45]. Overall, South Asia's financial investment in medical services is low relative to many other regions of the world, with the Maldives and Sri Lanka being the exception. Citizens of South Asia have more in common than they do distinctions, and inhabitants here must strive to maintain stability and utilize resources to enhance the region's wellness.

There is no centralized medical system in South Asia. Several qualified doctors operate in private organizations or clinics that provide care that is comparable to Western standards, while the bulk of the community is forced to rely on substandard or nonexistent medical treatment. There seems to be no expert assistance in many remote places, excluding the infrequent medical officer. People must travel large distances, delaying even suboptimal care [46]. In the world we live in now, it's important to use rational therapy based on strong experimental findings, especially in poor countries where resources are limited and public health care is either not available or not good enough [47]. Such countries cannot afford to waste resources on ineffective treatments [48]. The amount of money and time that an individual spends on their health treatment is also significant. With scarce resources, EBM may be a viable option for delivering appropriate health care.

South Asian countries are diverse in terms of culture as well as medical practice, ranging from huge super-specialty clinics with clinicians skilled in the most up-to-date techniques to quacks who treat patients only based on experience or practice. Ironically, these enormous, well-equipped clinics can only serve a limited, affluent segment of the population, and the bulk of sufferers are managed by doctors who are minimally trained or unskilled. As per research, this region has poor knowledge regarding EBM. According to multiple survey data, EBM has been implemented in some parts of South Asia, while it is still unknown in others. Due to resource restrictions among most healthcare institutions in South Asia, the whole cycle of EBM can only be applied to a small number of conditions. The majority of issues must be

resolved at the intuitive end of the intellectual continuum. Evidence-based medications undoubtedly necessitate the training and acquisition of new skills (literature browsing and systematic review), which most practitioners regard as burdensome [49].

Need for Technology in Evidence-Based Medicine to Facilitate Healthcare and Deliver Care Remotely

With the emergence of fast and accessible operating systems in the early years of the twenty-first century, we have seen incredible technological advancement. Concurrently, a worldwide connection enabled by internet and satellite techniques has caused a spike in the number of 'network participants' for information exchange. The temporal convergence of various concurrent events has led to the advent of new mobile health (mHealth) innovations. The human urge to deliver and receive high-quality, inexpensive medical treatment promptly has accelerated the progress of medicine. In today's hyper-connected society, mobile technology seems to have become a vital component. Modern medicine is transforming the manner in which it promotes and delivers treatment. Innovations in this technology and telehealth have made a big impact on this. While a wave of freely accessible technologies has captured the interest of the medical world and enhanced access to medication, especially in distant locations, there must be a concern about telemedicine approaches' security, dependability, consistency, and precision. The use of mobile technologies to deliver basic health care is becoming more common. Mobile devices have the potential to revolutionize the way health interventions are delivered. Mobile technology could make health programs better and give more people access to medicine [50]. Masses of rural residents now have access to adequate communication and information transfer technologies thanks to the spectacular expansion and profound usage of smartphone communications. The increasing use of mobile phones heralds the potential of using mobile technologies to deliver mobile medical solutions. One of the benefits of telephones in continuous patient care is that they can help clients and healthcare providers talk to each other in more than one way. This makes the connection between them more dynamic [51]. In today's hyper-connected society, mobile technology has become a crucial element. However, despite the hurdles that older folks encounter when it comes to the use of mobile technology when they do, new technology becomes an important part of their everyday lives since it helps them to maintain contact with family [52]. Even now, research shows that mobile technology can be a kind of personal and situational support for older adults who don't know enough about their health, making it easier for patients and providers to work together for self-management [53]. To promote social help and avoid relapse, technology could be used in a variety of ways. Via internet support organizations and associations, it can allow individuals in treatment to communicate with each other and assist one another. It may provide a range of easy options to contact people like clinicians or significant others (e.g., texts and emails, telephone conversations). Telemedicine and mobile

technology will become a fundamental element of medical practice shortly, thanks to technological advancements and the low cost of handheld equipment. The practice of medicine that is aided by portable diagnostic equipment is referred to as mHealth. The use of these devices at the point of care is changing the way healthcare is given from being led by the healthcare system to being led by the patient [54, 55]. The confluence of these elements offers an unrivaled opportunity to promote patient involvement, save medical costs, and improve results [56]. The rising usage of communications technology platform services in the medical industry has resulted in the aim to enhance and ensure improved medical services. Online communication is gaining popularity in the medical field as a means of tracking disease outbreaks, assessing patient care, diagnosing clients, training patients, and gathering and disseminating data using simple cell phones. Several studies have shown that smartphones can be used to share information about patient safety and manage people's attendance at certain health events [57]. Medical professionals can rapidly update and access patient information using mobile technologies from anywhere within a telecommunications network's range. This assures that patients' health records are updated regularly. Physicians who have access to the most recent data are better able to make medication judgments. The use of mobile technology-based applications may remove needless paperwork, leading to more efficient and successful patient care. Many initiatives

have used short messaging service (SMS) systems to ensure patient adherence, such as the Mobile Med Alert, a cellular health warning system that delivers patients SMS reminding patients to consume their medications. The HeartSaver is a special cell phone for health care that can monitor a patient's electrocardiogram (ECG) in real-time and automatically find many heart diseases [58]. The AarogyaSetu and Cowin smartphone applications were a huge hit in India during the COVID outbreak. At the same time, Cowin did its job of making vaccines easy to get and safe to schedule, and AarogyaSetu worked on keeping track of the local COVID infection record.

Medical practice in reality is complicated, and it poses crucial challenges regarding how we might create clinically useful electronic health data. Clinicians are starting to wonder if having more gadgets means having more information but if any of that information is redundant or even useless.

Mobile Devices in Healthcare: Applications and Benefits

The need for better communication and information tools at the point of service has been a big reason why healthcare professionals use mobile devices so much [59]. In a clinical context, healthcare practitioners should have access to a variety of resources as described in **Table 1** [60].

Table 1. Highlights the various ease of resources by the use of mobile technology in healthcare delivery.

S. No	Category	Resource
1	Communication	Voice calling Video conferencing Text E-mail
2	Hospital Information Systems	Electronic health Records Electronic medical records clinical decision support systems Picture archiving Communication systems
3	Informational Resources	Textbooks Guidelines Medical literature Drug references
4	Clinical Software Applications	Disease diagnosis aids Medical calculators
5	Time Management	Schedule appointments Schedule meetings Record call schedule
6	Patient Monitoring	Monitor patient health Monitor patient location Monitor patient rehabilitation Collect clinical data Monitor heart function
7	Reference and Information Gathering	Medical textbooks Medical journals Medical literature Literature search portals

Benefits of Mobile Technology in Evidence-Based Medicine: Healthcare practitioners have reaped numerous benefits from smartphones, including the ability to make faster decisions with fewer errors, improve data organization and accessibility, and increase practice efficiency and expertise. Most notably, these advantages have been found to improve patient care delivery, as evidenced by a decrease in adverse effects and a shorter duration of hospitalization [61-63]. More benefits of mobile devices and apps for healthcare professionals who use evidence-based medicine are talked about.

Ease and Comfort: Evidence-based medicine is easier to use during treatment with the help of many smartphone apps [64]. Using a smartphone in clinical practice has some advantages, including portability, quick access to relevant information and multimedia materials, adaptable communications, and a variety of strong apps that may be used for a variety of tasks [65]. Medical school healthcare practitioners and students regard the instantaneous availability of information at the point of need as a major benefit. Other research says that keeping up with new books, guidelines, reviews, and medical literature is a valuable convenience.

Medical apps have made mobile devices essential tools for making medical decisions at the point of care. This makes it easier to make medical decisions [66]. This is important for evidence-based medicine because doctors may not always look for answers to clinical questions after each clinical interaction [67]. Experienced clinicians and medical and nursing learners agree that medication guides, clinical dictionaries, disease diagnosis, and medical calculator applications are among the most valuable mobile applications for supporting EBM and medical decision-making. Mobile phones can also help pharmacists make better decisions by giving them fast access to different drug information sources and other medical references.

Improved Accuracy: It has been shown many times that mobile platforms can improve the accuracy and quality of patient documentation. This benefit is often attributed to how easy they are to use [68]. There have been reports of better diagnostic grading, more regular documentation of adverse effects, and greater pharmaceutical safety due to fewer medication mistakes. Documentation created with a mobile device was assessed to be of greater quality than documentation created with paper records, depending on a more comprehensive explanation of clinical findings and an accurate progress evaluation. Medical mistakes can also be

cut down on by making sure people in hospitals talk to each other on time, especially in critical care settings.

Improve Efficiency: Using mobile platforms has been shown to help practitioners in various ways, including better patient documentation (with fewer mistakes and more accurate records), faster access to new information, and better workflow [69]. Physicians have stated that obtaining information from a pharmacological database via a mobile device results in more effective decisions and care delivery. Mobile phone use has been linked to greater coordinated care, as well as increased efficiency in clinical support services, according to professionals working in medical care organizations. Doctors who used mobile devices while going from patient to patient said they spent less time looking for, gathering, and writing down information, which gave them a lot more time to spend on direct patient care.

Productivity Improvements: Mobile apps can also help pharmacists be more productive by letting them quickly look over important drug information like side effects and interactions. This makes it easier for them to fill prescriptions faster. Seventy pharmacists who used a mobile device said they were able to record more information and fill out more sections, which led to more detailed documentation. Mobile apps can also make it easier to keep track of personal and work schedules and information, which leads to better performance and productivity [70].

Mobile Technology as a Savior During the COVID Pandemic

Considering the prevailing COVID-19 epidemic, which stresses social isolation, the advantages of mHealth must be emphasized to stimulate its adoption. The mHealth network has provided support in dealing with epidemics with some recommended solutions [71]. The AarogyaSetu App, which detects people at risk and who are infected with the SARCCoV2 virus, is a good example of such an application employed by the Indian government. This app was designed after analyzing the pattern and comprehending the pandemic. By conveying information as much as needed at the touch of a button, mobile phones have become a powerful follow-up tool in a time of pandemics. The data depicting disease outbreak density and how it is evolving aided in determining containment measures and coordinating the fightback mechanism. Using models of the healthy, the sick, and the immune system, it would be possible to estimate when the pandemic or epidemic would end in real-time [72].

Due to COVID-19's increased prevalence, tracking is crucial, and mHealth potentially plays a key role in addressing it. According to studies, mHealth contact tracing and surveillance is an effective technique to decrease the transmission of disease [73]. mHealth could also be used to keep track of any outbreaks, send out alerts about vaccines, make people more aware of how they act when they need health care, and for self-monitoring [74-78].

RESULTS AND DISCUSSION

Over the last decade, medical professionals have become increasingly interested in the concept of EBM. Evidence-based medications enabled a shift from the centuries-old empiric practice that had dominated medical history. Evidence-based medications are usually regarded as the "gold standard" for medical competence, with a few exceptions. Evidence-based medication shaved to significant advancements in methodology, allowing us to distinguish between beneficial and harmful treatments; identify serious issues with publication bias, and uncover and address industry conflicts of interest. Its true goal is that a physician chooses the best available outcome for his patient based on the best available evidence, to provide them with the finest possible medical services in every way. It is also used to avoid severe errors during therapy, thus improving the quality of the healthcare supplied to the patient. On the other hand, EBM has grown into a unified way to understand and improve medical practice. Attempts to enhance the evidence that underpins medicine have a rich history and will probably continue. To increase the dependability of research outcomes, the EBM revolution has emphasized the necessity of and effectively advocated for complete access to clinical trial data.

South Asia is a diverse region with many concerns, including public health issues. In certain countries, sociological, governmental, and economic progress have resulted in significant health advancements, whereas in others, minor changes have occurred. Such health concerns cannot be ignored by public policy within those countries, since they may have significant social and economic ramifications. It is difficult to predict the future of EBM in South Asia at this time. The fact that initiatives have already been taken to foster evidence-based practices gives reason for optimism, but they must be supplemented. With the growing emphasis on EBM and the current socioeconomic expansion of South Asian countries, there is optimism for improved medical treatment in the future. In various countries, mobile phone treatments are growing rapidly, and preliminary research suggests that South Asian countries could gain profits from this technology as well. The enormous number of mobile phone users demonstrates the technology's utility, and mobile phones may be used as a layer of contact between patients and therapists. People can receive text messages and verbal alerts for checkups and drugs using the mobile technology-dependent notification system outlined above. The project is still in process. Human-to-human contact (such as between a doctor

and a patient) will be reduced by the system, which will be replaced by human-to-system interaction. This system will save money and lives in different countries health services, where patients need to travel miles to clinics to receive medication, which is often impossible due to distance, transportation problems, poor weather, or a worsening condition that hinders people from leaving home.

CONCLUSION

Digital healthcare initiatives for people can provide a wide range of benefits, which include enhanced skill-training possibilities in real-world settings, constant support from medical practitioners, better medication management, increased patient treatment conformity, and additional tools for self-monitoring. The integration of EBM and mobile technology will not only make EBM more accessible and successful, but it will also allow for more timely implementation of EBM. We can say that correct and correlated use of EBM and mobile technology saves doctors' time and improves their expertise, as well as the advances in medical services offered and healthcare providers' comfort.

ACKNOWLEDGMENTS: I convey my sincere gratitude to the pharmacy department at Pranveer Singh Institute of Technology for allowing me to create this review article.

CONFLICT OF INTEREST: None

FINANCIAL SUPPORT: None

ETHICS STATEMENT: None

REFERENCES

1. Shafi S, Collinsworth AW, Richter KM, Alam HB, Becker LB, Bullock MR, et al. Bundles of care for resuscitation from hemorrhagic shock and severe brain injury in trauma patients—translating knowledge into practice. *J Trauma Acute Care Surg*. 2016;81(4):780-94.
2. Brookman-Frazee L, Stahmer A, Stadnick N, Chlebowski C, Herschell A, Garland AF. Characterizing the use of research-community partnerships in studies of evidence-based interventions in children's community services. *Adm Policy Ment Health*. 2016;43(1):93-104.
3. Ishii LE, Tollefson TT, Basura GJ, Rosenfeld RM, Abramson PJ, Chaiet SR, et al. Clinical Practice Guideline: Improving Nasal Form and Function after Rhinoplasty. *Otolaryngol Head Neck Surg*. 2017;156(2_suppl):S1-S30.
4. Peat JK, Mellis C, Williams K, Xuan W. *Health science research: A handbook of quantitative methods*. Routledge; 2020.
5. van Beljouw I, Verhaak P, Prins M, Cuijpers P, Penninx B, Bensing J. Reasons and determinants for not receiving treatment for common mental disorders. *Psychiatr Serv*. 2010;61(3):250-7.
6. Cleiren MP. Bereavement and adaptation: A comparative study of the aftermath of a death. Taylor & Francis; 2019.
7. Amiri H, de Sitter A, Bendfeldt K, Battaglini M, Wheeler-Kingshott CA, Calabrese M, et al. Urgent challenges in quantification and interpretation of brain grey matter atrophy in individual MS patients using MRI. *Neuroimage Clin*. 2018;19:466-75.
8. Meijnikman AS, De Block CE, Verrijken A, Mertens I, Corthouts B, Van Gaal LF. Screening for type 2 diabetes mellitus in overweight and obese subjects is made easy by the FINDRISC score. *J Diabetes Complications*. 2016;30(6):1043-9.
9. Tanenbaum S. What patients know: evidence-based medicine and its discontents in the US. *Eur J Pers Cent Healthc*. 2014;2(2):162-5.
10. Sackett DL, Rosenberg WM, Gray JA, Haynes RB, Richardson WS. Evidence based medicine: what it is and what it isn't. *BMJ*. 1996;312(7023):71-2.

11. Krägeloh CU, Henning MA, Billington R, Hawken SJ. The relationship between quality of life and spirituality, religiousness, and personal beliefs of medical students. *Acad Psychiatry*. 2015;39(1):85-9.
12. Vandeweerd JM, Kirschvink N, Clegg P, Vandenput S, Gustin P, Saegeman C. Is evidence-based medicine so evident in veterinary research and practice? History, obstacles, and perspectives. *Vet J*. 2012;191(1):28-34.
13. Parkin HJ, Hepplestone S, Holden G, Irwin B, Thorpe L, Muir Gray JA. Evidence-based healthcare: How to make health policy and management decisions. London: Churchill Livingstone. Strand 6: Learning and teaching strategies. 1997;35(5):6.
14. Molto A, Dougados M. Comorbidity indices. *Clin Exp Rheumatol*. 2014;32(5 Suppl 85):131-4.
15. Keay S, Sargeant JM, O'Connor A, Friendship R, O'Sullivan T, Poljak Z. Veterinarian barriers to knowledge translation (KT) within the context of swine infectious disease research: an international survey of swine veterinarians. *BMC Vet Res*. 2020;16(1):1-7.
16. Institute of Medicine (US) Committee on Standards for Developing Trustworthy Clinical Practice Guidelines. Clinical Practice Guidelines We Can Trust. Graham R, Mancher M, Miller Wolman D, Greenfield S, Steinberg E, editors. Washington (DC): National Academies Press (US); 2011. PMID: 24983061.
17. Wardell D. Guideline evaluation. *J Adv Pract Oncol*. 2013;4(1):62.
18. Samson D, Schoelles KM. Chapter 2: medical tests guidance (2) developing the topic and structuring systematic reviews of medical tests: utility of PICOTS, analytic frameworks, decision trees, and other frameworks. *J Gen Intern Med*. 2012;27 Suppl 1(Suppl 1):S11-9.
19. López-Cano M, García-Alamino JM. Guidelines: Options and Limit. In: *The Art of Hernia Surgery 2018* (pp. 79-88). Springer, Cham.
20. Romanczyk RG, Callahan EH, Turner LB, Cavalari RN. Efficacy of behavioral interventions for young children with autism spectrum disorders: Public policy, the evidence base, and implementation parameters. *Rev J Autism Dev Disord*. 2014;1(4):276-326.
21. Sargeant JM, O'Connor AM. Introduction to systematic reviews in animal agriculture and veterinary medicine. *Zoonoses Public Health*. 2014;61 Suppl 1:3-9.
22. Vu-Ngoc H, Elawady SS, Mehayar GM, Abdelhamid AH, Mattar OM, Halhouli O, et al. Quality of flow diagram in systematic review and/or meta-analysis. *PloS one*. 2018;13(6):e0195955.
23. Berwick DM. Avoiding overuse—the next quality frontier. *Lancet*. 2017;390(10090):102-4.
24. Rubenstein JH, Pohl H, Adams MA, Kerr E, Holleman R, Vijan S, et al. Overuse of Repeat Upper Endoscopy in the Veterans Health Administration: A Retrospective Analysis. *Am J Gastroenterol*. 2017;112(11):1678-85.
25. Greenhalgh T, Howick J, Maskrey N. Evidence Based Medicine Renaissance Group. Evidence based medicine: a movement in crisis? *BMJ*. 2014;348:g3725.
26. Ma B, Qi GQ, Lin XT, Wang T, Chen ZM, Yang KH. Epidemiology, quality, and reporting characteristics of systematic reviews of acupuncture interventions published in Chinese journals. *J Altern Complement Med*. 2012;18(9):813-7.
27. Armijo-Olivo S, da Costa BR, Cummings GG, Ha C, Fuentes J, Saltaji H, et al. Cochrane to assess the quality of clinical trials? A meta-epidemiological study. *PloS one*. 2015;10(7):e0132634.
28. da Costa BR, Hilfiker R, Egger M. PEDro's bias: summary quality scores should not be used in meta-analysis. *J Clin Epidemiol*. 2013;66(1):75-7.
29. Ide K, Yamada H, Kawasaki Y. Effect of gargling with tea and ingredients of tea on the prevention of influenza infection: a meta-analysis. *BMC Public Health*. 2016;16:396.
30. Hariohm K, Prakash V, Saravankumar J. Quantity and quality of randomized controlled trials published by Indian physiotherapists. *Perspect Clin Res*. 2015;6(2):91.
31. Shauly O, Gould DJ, Sahai-Srivastava S, Patel KM. Greater occipital nerve block for the treatment of chronic migraine headaches: a systematic review and meta-analysis. *Plast Reconstr Surg*. 2019;144(4):943-52.
32. Nikbazzm R, Rahimi Z, Moradi Y, Alipour M, Shidfar F. The effect of cranberry supplementation on *Helicobacter pylori* eradication in *H. pylori*-positive subjects: A Systematic Review and Meta-analysis of Randomized Controlled Trials. *Br J Nutr*. 2021;1-10.
33. Bradko V, Castillo H, Janardhan S, Dahl B, Gandy K, Castillo J. Towards guideline-based management of tethered cord syndrome in spina bifida: a global health paradigm shift in the era of prenatal surgery. *Neurospine*. 2019;16(4):715.
34. Moynihan R, Henry D, Moons KG. Using evidence to combat overdiagnosis and overtreatment: evaluating treatments, tests, and disease definitions in the time of too much. *PLoS Med*. 2014;11(7):e1001655.
35. Kwag KH, González-Lorenzo M, Banzi R, Bonovas S, Moja L. Providing doctors with high-quality information: an updated evaluation of web-based point-of-care information summaries. *J Med Internet Res*. 2016;18(1):e5234.
36. Paynter R, Bañez LL, Erinoff E, Lege-Matsuura J, Potter S. Commentary on EPC methods: an exploration of the use of text-mining software in systematic reviews. *J Clin Epidemiol*. 2017;84:33-6.
37. Paynter RA, Featherstone R, Stoeger E, Fiordalisi C, Voisin C, Adam GP. A prospective comparison of evidence synthesis search strategies developed with and without text-mining tools. *J Clin Epidemiol*. 2021;139:350-60.
38. Sim I. Two ways of knowing: big data and evidence-based medicine. *Ann Intern Med*. 2016;164(8):562-3.
39. McCartney M, Treadwell J, Maskrey N, Lehman R. Making evidence based medicine work for individual patients. *BMJ*. 2016;353:i2452.
40. Maragkos GA, Papavassiliou E, Stippler M, Filippidis AS. Civilian gunshot wounds to the head: prognostic factors affecting mortality: a meta-analysis of 1774 patients. *J Neurotrauma*. 2018;35(22):2605-14.
41. Mushtaq MU, Gull S, Shad MA, Akram J. Socio-demographic correlates of the health-seeking behaviors in two districts of Pakistan's Punjab province. *J Pak Med Assoc*. 2011;61(12):1205.
42. Ganesh A, Chari JK, Rajkumar M, Archana B, Balaji S. Awareness, attitude and obstacles in research among dental professionals in Chennai: an institutional-based survey. *Indian J Public Health*. 2020;11(03):669.
43. bait Fadhil BS, Al-Suqri MN, Saleem NE, AlKindi SS. Evidence-Based Decision-Making—A Review of Key Literature to Inform Development of a Model for the Council of Oman. *Int Res*. 2018;8(4).
44. Wasay M, Khatri IA, Kaul S. Stroke in south Asian countries. *Nat Rev Neurol*. 2014;10(3):135-43.
45. Hisham R, Liew SM, Ng CJ. A comparison of evidence-based medicine practices between primary care physicians in rural and urban primary care settings in Malaysia: a qualitative study. *BMJ open*. 2018;8(7):e018933.
46. Chourey J, Prakash A. Good Evidence, Bad Linkages: A Review of Water and Health in South Asia. *Asian J Water Environ Pollut*. 2010;7(1):5-17.
47. Akhtar S, Ahmed A, Randhawa MA, Atukorala S, Arlappa N, Ismail T, et al. Prevalence of vitamin A deficiency in South Asia: causes, outcomes, and possible remedies. *J Health Popul Nutr*. 2013;31(4):413.
48. Marphatia AA, Ambale GS, Reid AM. Women's Marriage Age Matters for Public Health: A Review of the Broader Health and Social Implications in South Asia. *Front Public Health*. 2017;5:269.
49. Alam K, Mahal A. The economic burden of angina on households in South Asia. *BMC Public Health*. 2014;14(1):1-2.
50. Heron KE, Smyth JM. Ecological momentary interventions: incorporating mobile technology into psychosocial and health behavior treatments. *Br J Health Psychol*. 2010;15(1):1-39.
51. Nglazi MD, Bekker LG, Wood R, Hussey GD, Wiysonge CS. Mobile phone text messaging for promoting adherence to anti-tuberculosis treatment: a systematic review. *BMC Infect Dis*. 2013;13(1):1-6.
52. Seto E, Leonard KJ, Cafazzo JA, Barnsley J, Masino C, Ross HJ. Mobile phone-based telemonitoring for heart failure management: a randomized controlled trial. *J Med Internet Res*. 2012;14(1):e1909.
53. Schranz M, Di Caro GA, Schmickl W, Elmenreich W, Arvin F, Şekerioğlu A, et al. Swarm intelligence and cyber-physical systems: concepts, challenges and future trends. *Swarm Evol Comput*. 2021;60:100762.
54. Topol EJ, Steinhilbl SR, Torkamani A. Digital medical tools and sensors. *Jama*. 2015;313(4):353-4.

55. Kumar S, Nilsen WJ, Abernethy A, Atienza A, Patrick K, Pavel M, et al. Mobile health technology evaluation: the mHealth evidence workshop. *Am J Prev Med.* 2013;45(2):228-36.
56. Silva BM, Rodrigues JJ, de la Torre Díez I, López-Coronado M, Saleem K. Mobile-health: A review of the current state in 2015. *J Biomed Inform.* 2015;56:265-72.
57. Sankari Z, Adeli H. HeartSaver: A mobile cardiac monitoring system for auto-detection of atrial fibrillation, myocardial infarction, and atrioventricular block. *Comput Biol Med.* 2011;41(4):211-20.
58. Mosa AS, Yoo I, Sheets L. A systematic review of healthcare applications for smartphones. *BMC Med Inform Decis Mak.* 2012;12(1):1-31.
59. Ventola CL. Mobile devices and apps for health care professionals: uses and benefits. *Pharm Ther.* 2014;39(5):356-64.
60. Al-Ghamdi S. Popularity and impact of using smart devices in medicine: experiences in Saudi Arabia. *BMC Public Health.* 2018;18(1):1-7.
61. Capraş RD, Bolboacă SD. An evaluation of free medical applications for android smartphones. *Appl Med Inform.* 2016;38(3-4):117-32.
62. Kamel Boulos MN, Giustini DM, Wheeler S. Instagram and WhatsApp in health and healthcare: An overview. *Future internet.* 2016;8(3):37.
63. Neto OB, Loyo R, Albuquerque J, Perazzo J, Barbosa V, Barbosa CS. Using mobile technology to conduct epidemiological investigations. *Rev Soc Bras Med Trop.* 2015;48:105-7.
64. Kullar R, Goff DA. Transformation of antimicrobial stewardship programs through technology and informatics. *Infect Dis Clin.* 2014;28(2):291-300.
65. Ben-Mussa A, Paget AM. Popular apps in the medical category targeting patients and the general public in the United Kingdom: Do they conform to the Health On the Net Foundation principles? *Health Inform J.* 2018;24(3):259-76.
66. Roughley M, MacDougall L, Erolin C. Cystic Fibrosis: A Pocket Guide. *J Visual Commun Med.* 2020;43(4):198-210.
67. Alturki R. Research onion for smart IoT-enabled mobile applications. *Sci Program.* 2021;2021.
68. Lewis TL, Wyatt JC. mHealth and mobile medical apps: a framework to assess risk and promote safer use. *J Med Internet Res.* 2014;16(9):e3133.
69. Zhao J, Freeman B, Li M. Can mobile phone apps influence people's health behavior change? An evidence review. *J Med Internet Res.* 2016;18(11):e5692.
70. Glasgow RE, Harden SM, Gaglio B, Rabin B, Smith ML, Porter GC, et al. RE-AIM planning and evaluation framework: adapting to new science and practice with a 20-year review. *Front Public Health.* 2019;7:64.
71. Sharma S, Kumari B, Ali A, Yadav RK, Sharma AK, Sharma KK, et al. Mobile technology: A tool for healthcare and a boon in a pandemic. *J Prim Care Spe.* 2022;11(1):37.
72. Sahu KS, Majowicz SE, Dubin JA, Morita PP. NextGen Public Health Surveillance and the Internet of Things (IoT). *Front Public Health.* 2021;9:756675.
73. Abd Elhameed Ali R, Ahmed Ghaleb A, Abokresha SA. COVID-19 related knowledge and practice and barriers that hinder adherence to preventive measures among the Egyptian community. An epidemiological study in Upper Egypt. *J Public Health Res.* 2021;10(1):1943.
74. Wang C, Wang D, Abbas J, Duan K, Mubeen R. Global Financial Crisis, Smart Lockdown Strategies, and the COVID-19 Spillover Impacts: A Global Perspective Implications From Southeast Asia. *Front Psychiatry.* 2021;12:643783.
75. Madaan G, Swapna HR, Kumar A, Singh A, David A. Enactment of sustainable technovations on healthcare sectors. *AP JHM.* 2021;16(3):184-92.
76. Zheng M. Surveillance and disease control in COVID-19: Big data application in public health. In *International Conference on Applications and Techniques in Cyber Security and Intelligence 2021 Jun 19* (pp. 565-570). Springer, Cham.
77. Aadithi R, Devi PB. Passive Immunotherapeutic Approaches for Treating Covid-19: A Comprehensive Review. *Int J Pharm Res Allied Sci.* 2022;11(2):52-61.
78. Bhardwaj M, Kapila R, Neha A, Jain R, Mittal P, Suri M. Awareness, Perceived Risk, and Protective Behavior Towards Covid-19 Among Undergraduate Students of Delhi and NCR, India. *Int J Pharm Res Allied Sci.* 2022;11(3):71-80.