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Abstract

Telemedicine is a broad topic that needs to be fully and comprehensively comprehended specifically on critical aspects upon which this novel medical technology is based. Broad light on technological position of telemedicine and nature of situations that call for its application is shed by various researchers. Subsequently, more individuals have gone ahead to elaborate on the various trends in telemedicine as well as establishes the various issues in this medical technology. Of course, every technological progress has its good as well as dark side, hence focusing on telemedicine affirmed pros and cons as well. Since telemedicine has been in existence for a while though has not been widely adopted, familiarizing with the current events rather status of this technology besides citing its amended and yet to be enacted legal provisions is critical. Consequently, although telemedicine is widely acclaimed, little is known about this guest technology's precise operation and fact-based evidence(s) to support or refute the claim. Lastly, establishing some of telemedicine intended or unintended consequences as well as offer recommendations for further telemedicine technology improvement ideas before considering its other uses is an important aspect.

Telemedicine

Certainly, there have been substantial significant as well as fundamental innovative inventions, completely new-fangled technologies, and process enhancements that have eternally revolutionized medical arena. To express a cordial appreciation and outline a few, they include immunizations, computed tomography scan (famously known as CT scanners), and the revered electronic health records. As the medical field enthusiasts look back with pride, they are majestically moving forward with determination through modern and recent technological transformations that are bound to revolutionize gears for the better. Telemedicine is one of the gears. Visits by an in-person physician are not a necessity for all medical complications and betterment of humanity. Thus, whatever is feasible and achievable to improve access to a physician or speed up the same should be done. Although telemedicine is still an incubate work, it has advanced by leaps and bounds thus ought to undeniably remain the best choice for scenarios where the nature of a circumstance, time, or both demand for its services.

Telemedicine Analysis

As a result of convenience telemedicine offers, patients in metropolises and remote areas are scrambling for its evident benefits. A recent study showed that the net worth of telemedicine industry by 2021 will be more than 65 billion dollars (Manocchia, 2020). Hence, necessitating a look into its current and future trends. In modern society, the app culture is ingrained and widespread building prospects of advanced telemedicine applications which shall to a greater degree enhance provider-patient interactions and communication. Also, the future is promising advent of better healthcare applications that will facilitate personalized patient information storage and retrieval with a single swipe.

Moreover, healthcare specialists are on the speedy upsurge annually. This has prompted physicians' migration away from grander infirmary complexes and the rise in community-based practices. The latter owes its explanation to massive infirmaries that provide their extra expert services in decentralized settings. Hence, as global evolution continue, it is projected that budding healthcare mavens in predilection of telemedicine flexibility will unceasingly spearhead decentralization by paving way to their telemedicine practices in hordes.

Again, telemedicine entirely relies on technology thus not immune to cyber-attacks. However, the more telemedicine industry perpetually continues to take action to brace security, supplementary rigorous measures of cybersecurity will emerge (Barnett et al., 2018). Meanwhile, a good number of smaller practices are straining in face of immutable threats such as severe state regulations to stay operational and in business. These small firms have reverted to established telemedicine organizations for answers leading to consolidation trend. The arrival of easy to utilize, widespread and secure distributed software will soon disrupt and make obsolete telemedicine industry and hospitals' patented software and hardware. The former promises to be affordable and user friendly than proprietary systems deployment. Lastly, telemedicine's ease and convenience will bring about a trend of fewer trips to emergency quarters for treatable illnesses.

While telemedicine sounds like a dream come true for easier and quicker medical services, several issues entangle it. First, all telemedicine services, restrictions and reimbursement rates are determined by a state legislature post-enactment of telemedicine parity law (Scott Kruse et al., 2018). Hence, despite the availability of parity laws in many states, amending state legislation has a grave impact on practices in telemedicine in a given state as it comes with downsides such as clumsy process as well as time-intense. Next, in comparison to

the conventional medical services, telemedicine services' compensation process is not that forthright. Compensation guidelines via private players and state medical aid programs are affected by continuous modifications of state telemedicine policy landscape.

Furthermore, healthcare professionals in meagre private practices are at a blink of telemedicine budget constraints. This is because as more solutions using telemedicine increase, telemedicine choices become sundry. For that reason, many programs demand procurement, implementation as well as worker training of this novel technology. These undertakings require heftier capital investment. Correspondingly, telemedicine industry endeavors to break loose provider-patient geographical barricades. However, current healthcare providers are licensed based on state and are required to operate within one and only one state of approval. This is an issue with a great impact on telemedicine.

In almost all scenarios, telemedicine is deemed to provide a net advantage. It holds a feasible promise to expand accessibility of quality healthcare for patients and to also transform for better the model of healthcare delivery. However, based on its virtual collaboration nature, technological and societal barriers with prospects of transforming the future, its downsides are worth deliberation too (Boxer & Ellimoottil, 2019). The thrust behind telemedicine field is to deliver more convenient and accessible healthcare. This not only gives telemedicine the power to go beyond geographical barricades to healthcare access but also revolutionize the model of care delivery into a more convenient one.

Similarly, by making typical physician visits more efficient besides ironing out creases such as unnecessary ER visits and lack of conformity to medication, telemedicine can lower healthcare spending by saving on healthcare expenses. Also, despite geographical location of a patient, he or she can see the required specialist on a rare condition such as cancer. As an

argumentation to this, telemedicine eases primary healthcare physicians' consultation process with other medical professionals on a given case of a patient. In a nutshell, telemedicine extends experts refers to accessibility. Through this medical technology, patients are likely to be engaged based on telemedicine potential to frequently and conveniently connect them with their respective doctors. Lastly, telemedicine amounts to better healthcare results as it facilitates easier follow-ups by healthcare providers, to ascertain positive responses to treatment by patients.

Nevertheless, just like many other solutions of technology, telemedicine podiums are not exempted from equipment procurements as well as employee training. Thus, demanding practical equipment and training (Chen, 2017). Parallel to retail health treatment, consumer-facing telemedicine organizations provide patients with hefty advantage of on-demand healthcare services, thus with such models in operation, healthcare continuity is bound to breakdown and eventually decrease. Besides, no one can underestimate the worth of in-person doctor visits. They have proved a number and again how significant they are in calling situations. Hence, telemedicine should be best adopted as visits supplementary. Lastly, with continuously evolving state policies, the elephant in the room is telemedicine reimbursement. It is complicated to navigate recompense before a shifting policy landscape.

Current telemedicine status is on the speeding wheels of evolution. As exponential technological advancements occur, so does prevalent of affordability and accessibility to fundamental tools of telemedicine. For instance, in the United States, video-chat applications such as Facetime have been utilized by majority of the population and are easy to access on mobile devices and computers (Vargas et al., 2018). So are technologies out there for real-time video telemedicine? Although US rolled out telemedicine primarily to aid patients in rural remote areas access healthcare services, today it has gradually been adopted as a convenient

medical care tool. Therefore, patients have contributed more to its adoption as many prefer spending less time in a physician waiting lobby as well as receive instant care for minor and urgent ailments. It is this expectation coupled with readily available healthcare professionals that have resulted in triumphing of telemedicine firms today.

Similarly, advancement of mobile health has revolutionized telemedicine field. The wide assortment of mobile health applications combined with innovative consumer-friendly mobile devices has prompted a good number of patients to start utilizing the power of technology to monitor besides tracking personal health. For instance, without requiring a visit to a doctor's office, home-based mobile devices could accept vitals and measure hypertension among other illnesses on behalf of a healthcare professional. Hence, as technological proactiveness among patients advance, patients will acquaint themselves with various alternatives via telemedicine on healthcare accessibility.

Notably, fundamental telemedicine provisions are still in development phases spearheaded by medical associations such as AMA. As states announce new legislation to endorse a policy of telemedicine, provisions for telemedicine remain in a persistent flux. Consequently, telemedicine provisions are likely to contrast from one state to the other based on the following key tenets: Parity laws. These laws demand that compensation of amount equating to in-person treatment should be adhered to by all private companies, albeit particulars of restrictions differ from state to state (Liu & Liu, 2017). Also, as a recap to the plus of telemedicine, it can provide its services beyond geographical boundaries. Thus, the cross-state licensing provision yet to be enacted will aid telemedicine healthcare providers to offer care to patients in the neighboring states without necessarily requiring operation license of that state.

Again, there is a patient informed provision in some states which require telemedicine providers to acquire knowledgeable consent of the patient for any telemedicine amenities. In this regard, the ball is in the court of the providers to ensure the patient is informed on telemedicine facilities and associated expectations. These consents range from verbal, written to none. Also, provision of online prescriptions in some states aims to provide explicit regulations on treatments that could be prescribed as well as those that cannot. For example, *schedule II* medications for chronic ailments are protected from telemedicine prescriptions as they require in-person visits while *schedule III & V* medicines can be prescribed through telemedicine services. Lastly, the provision of preexisting physician and patient affiliation requires all telemedicine provider as well as their patients to have a prior existing rapport. This calls for at least a single in-person visit between the doctor and the patient. However, in face of actions from organizations such as *DoctoronDemand* which connect patients with random on-call physicians, this provision is steadily transforming.

Yes. Telemedicine is a no brainer and it is fully working. To establish this, research, statistics, as well as findings, are critical. The figures of global telemedicine market indicate that the industry is exponentially growing. For instance, in 2014 the number stood at 17.8 billion dollars with projected growth in 2020 (Research and Markets, 2020). Also, in 2015, an estimated 800,000 virtual consultations took place in the US alone, and associated parties are continuously fueling it up. Through a survey, it was established that 84 percent of care senior managers deemed telemedicine to be vitally significant while 90 percent were in a quest to create or roll out a telemedicine program (Lacktman & Vernaglia, 2014). Similarly, as telemedicine foundation is quickly being made, a study showed that eager patient long to use telehealth amenities post acquaintance with its benefits as well as functioning.

Future improvement ideas for telemedicine industry will include personal facial expressions' emotions analysis to monitor an individual's wellbeing. Using advancements in technology, smart timepieces and glasses will monitor an ailing individual's health data as well as carry out real-time transmission to a health specialist (Wen et al., 2019). Correspondingly, attempts by companies such as *Augmedix* are underway to facilitate automatic transcription of patient's documents during a visit. Improvements in robotic surgery will facilitate surgeons to carry out operations from afar distances. However, to move at a similar pace, telemedicine industry will have to do away with critical barriers such as necessities for all medical practitioners to be licensed based on a specific state. Also, the projected multi-billion growth of the telemedicine industry is enough evidence that the industry is operational.

In conclusion, although it is pretty difficult to pinpoint a specific aspect as an intentional or unintentional consequence of telemedicine, a critical analysis of telemedicine trends could help cite a few. It was never intended to have almost all medical services go online but growth in technology such as robotics, sensors and artificial intelligence facilitated it. Suppose skills gap shall arise among healthcare professionals due to exponential growth of telemedicine technology, it should still be viewed as an unintentional consequence of telemedicine. Finally, telemedicine is destined to stay and much is in store for an optimistic telemedicine future. Hence, states that shall remain rigid towards enacting favorable telemedicine provisions will face a hard time opposing its benefit and development which was never premeditated.

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