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An Overview of the Telehealth Activities Conducted in the Field of Speech-Language Pathology

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ABSTRACT:-

It is estimated that around 650 million individuals, or 10% of the total population of the globe, live with a disability of some kind. Demand for health and rehabilitation services has increased as a result of factors like population growth, an ageing population, and medical advancements that preserve and prolong life. According to recent projections, there would be a scarcity of speech–language pathologists and other rehabilitation experts to give medical assistance to people with impairments. This problem can be effectively addressed by the implementation of telemedicine and telehealth technology. We conducted a thorough literature analysis, which includes looking at technical papers, websites, and publications from the American Speech-Language-Hearing Association, and articles from peer-reviewed journals about telehealth applications in speech–language pathology. A number of different applications of telehealth in speech-language pathology are discussed, including the types of technology involved, the level of satisfaction reported by patients and clinicians, the benefits of utilising telehealth, the difficulties and barriers involved in applying it, and potential future directions. The information gleaned from this analysis lays a solid groundwork for expanding the use of telehealth technologies in this sector of the healthcare industry.

Keywords: speech–language pathology, communication disorders, swallowing disorders, dysphasia, speech therapy, language therapy, telehealth, telepractice, telerehabilitation.

INTRODUCTION: -

Speech and language problems can range from a few speech sound abnormalities to a complete loss of the capacity to utilise speech to communicate successfully. These disorders can have a negative impact on a person's ability to talk, understand, read, and write. A swallowing difficulty, also known as dysphagia, is a serious health issue that has the potential to endanger a person's life. The evaluation, diagnosis, and treatment of communication and swallowing difficulties can be provided by speech-language pathologists (SLPs), who work with patients of all ages, from infants to the elderly. More than 130,000 speech-language pathologists, audiologists, and speech, language, and hearing scientists from the United States and around the world are members of the American Speech-Language-Hearing Association (ASHA), which is the professional, scientific, and credentialing association for those individuals [1].

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The lack of speech language pathologists is a big issue in a lot of different regions. The U.S. Bureau of Labor Statistics projects that employment of speech-language pathologists will increase by 11% from 2006 to 2016, which is roughly the same rate of growth as the average for all occupations [2]. The American Speech-Language-Hearing Association (ASHA) carried out a survey of the healthcare industry in 2005 and found that the number of open positions for SLPs had increased from 25% in 2002 to 40% in 2005. The field of home health care saw the greatest increase in the number of available positions [3].

A study of schools was carried out by ASHA in the year 2006, and the results showed that many school districts were suffering from substantial personnel shortages. Sixty-eight percent of respondents said that there were more job openings than there were job seekers [4]. The position of the American Speech-Language-Hearing Association (ASHA) is that telepractice or telehealth is an appropriate model of service delivery for the profession of speech–language pathology. This model of service delivery may be used to overcome barriers of access to services caused by distance, a lack of availability of specialists and/or subspecialists, and impaired mobility [5]

A wide variety of patients could potentially benefit from speech-language pathology (SLP) services, and research and demonstration projects have shown that telehealth is a paradigm that is possible, effective, and appropriate for delivering these treatments. A literature review reveals that medical professionals in the countries of Australia, Canada, Greece, Ireland, Japan, the United Kingdom, the United States, and Sweden are investigating the feasibility of using telehealth to diagnose, evaluate, and treat patients suffering from communication and swallowing disorders who might not otherwise have access to these services. The purpose of this work is to offer a critical analysis of the existing research in the field.

MATERIALS AND METHODS:-

An exhaustive search of the available literature, which included peer-reviewed journal publications, professional and lay articles, abstracts of presentations, and policy statements made by associations, was carried out. telehealth, telemedicine, telepractice, telerehabilitation, speech–language pathology, communication disorders, speech therapy, language therapy, swallowing difficulties, and dysphagia were some of the phrases that were used throughout the search.

RESULTS:-

The results of this search via the available literature were tallied and may be seen in the appendix. Instead of large, well-controlled, randomised clinical trials, the available literature mostly consists of pilot studies and anecdotal reports of telehealth applications. This is in contrast to policy documents, which make up the bulk of the current body of knowledge. The following is a discussion of different issues that were extracted from each of the sources.

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DISCUSSION:-

Patient Candidacy: In speech-language pathology (SLP), determining whether or not a patient is eligible for the telehealth model of service delivery is often done on a case-by-case basis applying stringent selection criteria. The following criteria are often taken into consideration, though this list is not exhaustive: (1) the ability to sit in front of a monitor and pay attention to the clinician; (2) the ability to see content on a computer monitor; (3) the ability to follow directions to operate the equipment; (4) the ability to sit in front of a camera and minimise extraneous movements to avoid compromising the image resolution; (5) the manual dexterity to operate a keyboard if necessary; (6) hearing acuity; (7) cognitive ability; (8) speech intelligibility; (9) comfort level with technology [6].

APPLICATIONS :-

When speech-language pathology (SLP) services are provided through telehealth, they can be provided in a variety of settings. These settings include medical centres, rehabilitation hospitals, specialty cancer care centres, satellite clinics, residential healthcare facilities, rural community health centres, Veterans Affairs Medical Centers, military medical facilities, universities, patient's homes, schools, and child care nurseries. Telehealth can also be used to provide these services. The majority of applications have as their primary focus the evaluation and/or treatment of speech, language, cognitive–communication, and swallowing impairments among underserved populations located in remote or rural areas of a district, county, state, province, or country.

Neurogenic Communication Disorders: Patients suffering from aphasia, dysarthria, apraxia, cognitive–communication disorders, and dementia as a result of cerebrovascular disease (CVA), traumatic brain injury (TBI), Parkinson's disease, cerebral palsy, or multiple sclerosis have benefited from speech-language pathologists' utilisation of the telehealth model to receive treatment. Telehealth has the ability to extend the continuum of care and improve clinical outcomes for these patients. This is especially important in view of the difficulties associated with obtaining insurance payment for longer hospital stays and shorter hospital stays overall [7].

Fluency Disorders: Because there are a limited number of specialised facilities for treating fluency disorders, such as stuttering, and because long-term follow-up for maintenance is typically required, telehealth is particularly helpful in the treatment of fluency disorders. Efficacious treatment of early stuttering during the preschool years is recommended in order to prevent progression to a long-term form of the disorder. Many children in Australia who reside in rural or remote locations do not have access to the Lidcombe Program of Early Stuttering Intervention, despite the fact that this treatment has been proved to be successful. Because it is carried out by parents with the assistance of a speech language pathologist, it is very simply adaptable to the delivery of telehealth services. The use of low-tech telehealth technology (training videos, recorded speech samples, telephone, and e-mail), according to

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the findings of a number of research trials; however, according to the findings of one study, the results were obtained with lengthier treatment times and at a higher cost when compared to traditional clinic-based delivery [8,9].

Voice Disorders: The Lee Silverman Voice Treatment (LSVT) was provided by speech pathologists in Australia via an Internet-based (128 Kbps) telerehabilitation application to a total of 10 participants who were diagnosed with Parkinson's disease (PD). Access to this treatment was limited for patients because of distance, the limited availability of certified LSVT clinicians in rural and remote areas of Australia, and patient mobility challenges that prevent or impede patients' ability to travel to a healthcare facility in either urban or rural environments. The data gathered from the therapy's outcomes showed that the online treatment was both practicable and successful [10].

Dysphagia: Patients who are at risk for dysphagia should undergo a comprehensive evaluation since swallowing difficulties can lead to considerable morbidity and mortality. On the other hand, dysphagia subspecialists might not be accessible in more isolated locations or in smaller rural villages. In addition to a clinical evaluation, instrumental examinations (such as videofluoroscopic and fiberoptic endoscopic examinations, for example) are frequently utilised to discover underlying factors and decide effective therapy options for swallowing problems. Researchers at the University of Illinois developed a programme that makes it possible to conduct real-time, remote, interactive evaluations of oral and pharyngeal swallowing function utilising video transmission over a T1 line. An experienced speech language pathologist at the controlling site was able to remotely conduct a modified barium swallow study using a specialised interface, as well as see and analyse in real time the videofluoroscopic pictures that were acquired in a hospital radiology suite [11].

Childhood Speech and Language Disorders: There has been a rise in both awareness of the need of early identification and diagnosis of speech and language impairments as well as the amount of emphasis placed on the subject. As a result of the implementation of the Individuals with Disabilities Education Act (IDEA) in 1990, which made it mandatory to provide special education and related services to all children who were eligible for them despite having a disability, rural schools were confronted with personnel shortages as well as problems with recruitment and retention. In the state of Oklahoma, a public school, a rural hospital, and a metropolitan rehabilitation hospital all came together to form a partnership in order to investigate the efficacy and acceptability of teletherapy in a public school setting [12]. The Center for Persons with Disabilities at Minot State University in North Dakota developed a programme to provide speech–language therapy in rural areas of the state of North Dakota where services were otherwise limited or nonexistent due to a shortage of speech-language pathologist (SLP) personnel. This programme uses interactive videoconferencing to deliver speech–language therapy [12].

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TECHNOLOGY

Telehealth Models of Service Delivery: Because of the fluid nature of communication, problem-solving, and the changing of behaviour, synchronous transmission is frequently required in order to conduct interactive evaluation and treatment of communication problems in "real time." Studies have shown that video teleconferencing (VTC) is a realistic and successful approach for providing speech-language pathology (SLP) services to clients who are located at a distance.

Equipment and Transmission Mediums: In the process of choosing equipment, the existence of the infrastructure or network to which it will connect is one of the most significant factors to take into account. Specifications for the equipment, connectivity mediums, and bandwidth change depending on the telehealth application being used and the outcomes that are intended. To properly assist the clinical procedure, the image and sound quality must be of sufficient quality. Telephones, videophones, fax machines, video teleconferencing units, computers with e-mail and video teleconferencing software and webcams, closed circuit televisions, and image scanners are some examples of the types of equipment that are utilised in speech-language pathology (SLP) telehealth applications [6].

Telehealth technology also known as telehealth. Since the quality of signals needs to support assessment and treatment of communication disorders, speech-language pathology sessions should not distort or interfere with communication, or they should only do so in a limited way that can be well-characterized [8]. It is essential to have an adequate bandwidth connection in order to guarantee the highest possible audio and visual quality for the purposes of clinical decision-making.

RESPONSE TO TELEHEALTH

Applications of telehealth have resulted in good comments from patients, in addition to having a positive impact on clinical outcomes. Telehealth is becoming an increasingly desirable method of providing medical care as a result of developments in technology and the pervasive presence of computers in our everyday lives. This is especially true for patients who have an interest in technical improvements. In the study conducted by Brennan et al.[9], four out of ten patients with left and right CVA reported that their comfort level was better in the telerehab condition. They stated that this was due to the fact that they felt "less self-conscious" when the clinician was out of the room or that they was "less distracted because the computer made it interesting." In a later trial with forty participants who had recently suffered a CVA or TBI, thirty-four of the forty patients indicated an interest in the potential use of VTC in the future. 43 In a case report that was written by Kully [10].

It is abundantly clear that the contentment of clinicians with the telehealth model is essential to the process of its widespread acceptance and deployment. Despite their early reservations, the vast majority of speech-language pathologists (SLPs) who are involved in telehealth have come around to the idea of using technology into their practises. Due to a lack of tactile

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feedback and cues, it may be necessary to come up with innovative solutions to problems, or it may even be impossible to apply methods that need "hands-on" delivery. However, researchers have observed that the absence of a clinician's physical presence does not damage the "human aspect" or reduce the effectiveness of services that are offered via telehealth [11].

ADVANTAGES OF TELEHEALTH

Telehealth has the potential to deliver services to underserved and isolated or rural geographic locations, where these services are not currently available. It also has the potential to deliver these services to geographic areas that lack subspecialists or specialists. According to a number of instances, telehealth also made it possible to access the medical facilities of a university. As a consequence of this, both the patient and the doctor were able to benefit from the knowledge and experience of a large number of medical specialists. This was especially beneficial for the clinician who practised in a remote setting where there were few opportunities to contact with colleagues for the purpose of enhancing their professional development and expanding their skill set [12-14].

CHALLENGES AND BARRIERS TO TELEHEALTH APPLICATIONS IN SPEECH–LANGUAGE PATHOLOGY

It may not be feasible to begin operations due to the high initial investment required to purchase and instal necessary equipment, as well as pay for ongoing maintenance and connectivity fees. Nevertheless, as a result of developments in technology, these expenses are going down. In addition, thanks to the proliferation of telehealth apps and the clear evidence of a positive cost-benefit ratio, telehealth systems are increasingly being used in a variety of settings, including hospitals, clinics, home healthcare agencies, and educational institutions [15].

FUTURE DIRECTIONS:-

One objective for the future is to incorporate telehealth services into everyday clinical and administrative operations in a way that is both smooth and efficient. The continued development and advancement of communication technologies should someday make it possible for patients to make secure connections from the comfort of their own homes, thanks to developments in both infrastructure and software. In order to support diagnostic and therapeutic processes and aims, research is required to develop standards for clinical protocols with equipment requirements (such as compression, resolution, and transmission quality). (Research Question 1: What are the basic needs for technology to ensure that telehealth services are efficient and effective while also being cost-effective?)

Once guidelines and standards have been established, they can be utilised to direct research questions and provide tools for the design of research protocols51. (Research Question 2: What assessment procedures and tests yield accurate and reliable information when delivered via telehealth to support diagnosis of communication disorders? The third research question

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asks, "Which therapy procedures, when administered via telehealth, generate effective and efficacious outcomes?"

CONCLUSION:-

An exhaustive assessment of the available research on the utilisation of telemedicine and telehealth technologies in SLP was carried out. Although a significant number of investigations and demonstrations have been reported, all of which have been met with a positive response from clinicians and patients, evidence from clinical trials is still required to validate speech–language pathology telehealth protocols. This evidence must include technical specifications, clinical efficacy and outcomes, and economic analyses. To the greatest extent possible, the arsenal of technology at the disposal of healthcare providers, such as speech-language pathologists (SLPs), should be utilised in order to make it possible to deliver higher-quality care in settings where experts are not physically present.

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