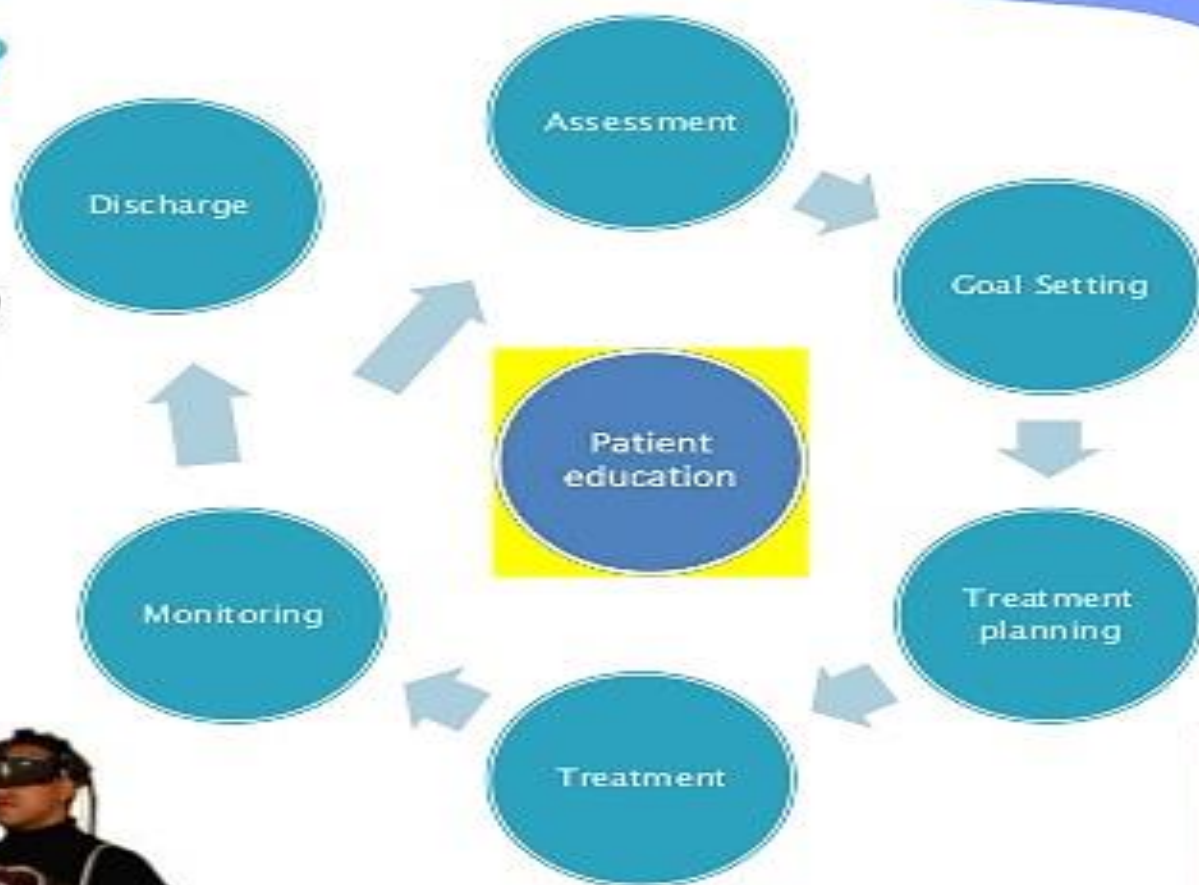
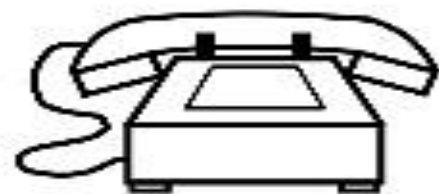


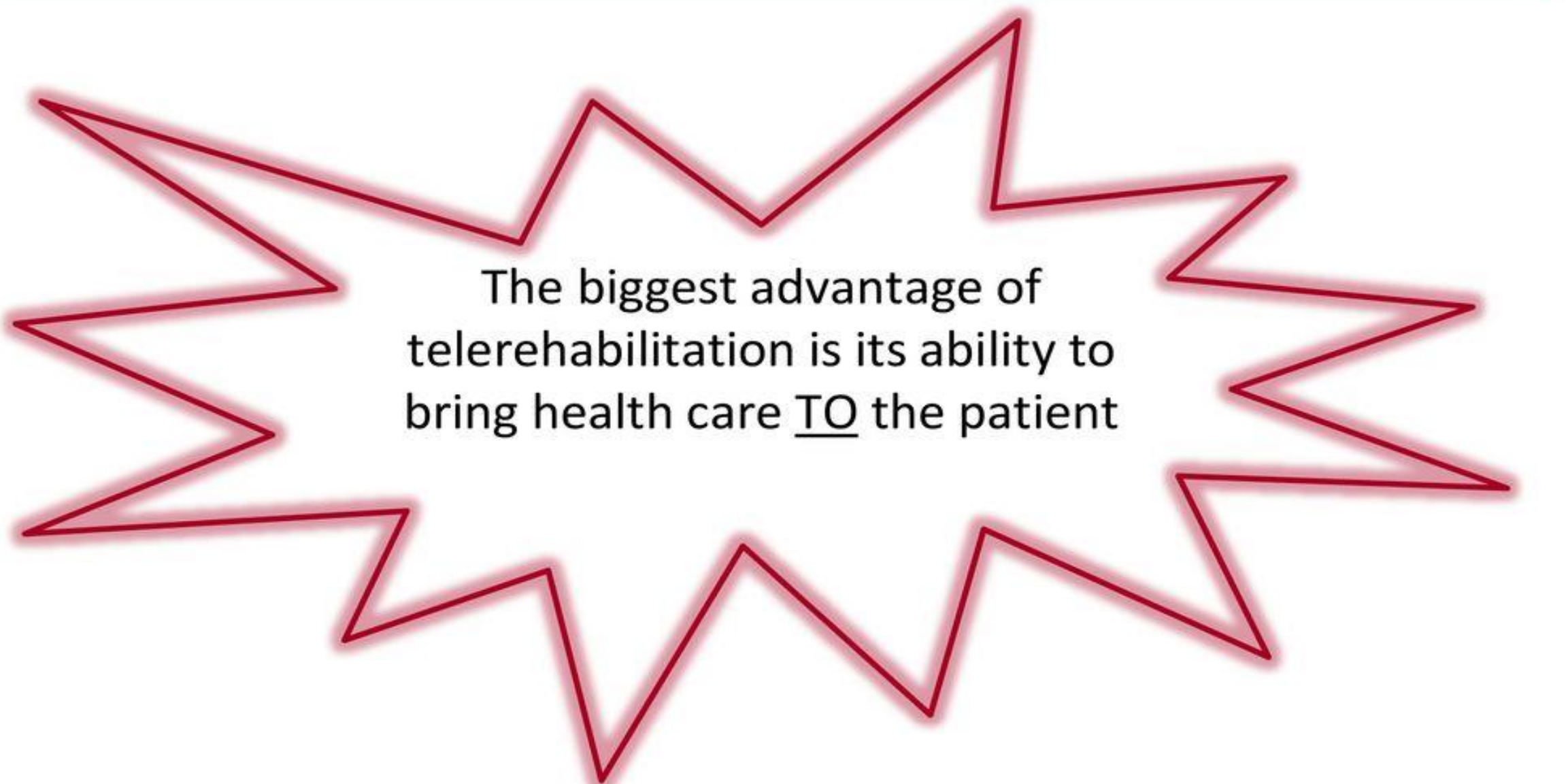
Telerehabilitation

Challenges and disadvantages

Rehabilitation



Benefits



The biggest advantage of telerehabilitation is its ability to bring health care TO the patient

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The biggest advantage of telerehabilitation is its ability to bring health care TO the patient

- Rural areas / Underserviced areas
- Rehab in the patient's own home
 - Comfortable in familiar surroundings
 - Don't like to exercise in a group
 - Family members can be involved
- Convenient - work around your own schedule



fit Group Fitness Schedule 2018 - 2019

Year	Mon	Tue	Wed	Thu	Fri	Sat
12:00-12:30						
12:30-1:00	Barre Fit					
1:00-1:30						
1:30-2:00						
2:00-2:30						
2:30-3:00						
3:00-3:30						
3:30-4:00						
4:00-4:30						
4:30-5:00						
5:00-5:30						
5:30-6:00						
6:00-6:30						
6:30-7:00						
7:00-7:30						
7:30-8:00						
8:00-8:30						
8:30-9:00						
9:00-9:30						
9:30-10:00						
10:00-10:30						
10:30-11:00						
11:00-11:30						
11:30-12:00						

Benefits

The biggest advantage of telerehabilitation is its ability to bring health care TO the patient

- No transportation hassles
- Weather is not a factor
- Ongoing / No session breaks
- Can provide options during gaps in other services
- Can help rehabilitation to begin as early as possible, be prolonged and continue during the recovery phase
- Reduced length of stay / Earlier discharge



Benefits

The biggest advantage of telerehabilitation is its ability to bring health care TO the patient

- Technology is less of a barrier than many think
- Can provide services to more patients, and more therapy to each patient
- Cost-effective – can be cheaper on the healthcare system and on participants
- Research shows equal or better outcomes compared to other methods of rehab delivery



Challenges(49)

Human factor(frequency)

- Skepticism/lack of acceptance/resistance to change/negative attitudes(9)
- lack of technical or digital knowledge and skills; needed in e-health training (6),
- concerned about apprehensions related to data privacy / confidentiality /security(4)
- Lack of awareness of telemedicine/telerehabilitation(3)
- Concerned about costs(2)
- Concerned about national laws/legalities(2)
- lack of acceptance of telehealth(2)
- Inadequate rapport(2)

- Lack of patient participation/poor adherence(2)
- Perceived inconvenience/time-consuming(2)
- Concerned about appropriateness(1)
- Concerned about effectiveness(1)
- Concerned about efficiency(1)

- Concerned about informed consents(1)
- Concerned about safety(1)
- Concerned about sustainability(1)
- Lack of satisfaction(1)
- Paper culture(1)
- Poor telecommunication skills(1)

organizational factors

- ❑ lack of national e-health policies or laws (in 9 studies),
- ❑ lack of health information systems framework/ICT infrastructures(8),
- ❑Lack of governance support (5),
- ❑Lack of data privacy measures and security (5)
- ❑Financing and reimbursement problems(4)
- ❑Lack of e-health resources(4)

- Lack of technical support(4)
- Lack of telerehabilitation guidelines/standards(4)
- Lack of training for providers(4)
- Unclear accountability/roles(3)
- Difficult implementation/unsustainable program/low utilization(2)

- Lack of studies/evidence(2)
- Time-consuming process;busy work schedule(2)
- Environmental constraints to telehealth(1)
- Lack of exercise equipment(1)
- Lack of updated community-based rehabilitation policies(1)
- Lack of validated data collection tools/performance measures(1)

Technical challenges

Internet was the overall number 1 challenge to telehealth for example in the Philippines, as mentioned in at least 10 studies.

- Show internet/limited internet coverage(10)
- difficult or time-consuming to use/sustain(3)
- lack of security(3)
- Lacks interoperability(3)
- Software limitations/inadequacies(3)
- Dependence on electricity(2)
- Dependence on internet(2)
- Difficult examination/treatment(2)
- Hardware failure/defects/limitation(2)

- Inadequate infrastructure(2)
- Limitations of artificial intelligence(2)
- Unclear video/display(2)
- Expensive(1)
- Lacks capacity for empathy(1)
- Lacks contextualization(1)
- Lacks correlation with face-to-face assessment/treatment(1)
- licensed proprietary software(1)
- Limited network coverage(1)

Barriers to telerehab

- Diagnosis in some cases is a challenge
 - Manual tests like checking the muscle strength, reflexes, sensations
 - Performing special tests
 - Motor control assessment
- Connectivity issues/ technical issues
- Patient safety risks – balance/fall risks; transfers; gait
- Word of caution
 - use your professional judgment if telerehab is appropriate for the patient
 - Decision should be case to case dependent
 - Not every patient is appropriate (hearing or vision deficits, comprehension deficits)
 - Therapist must understand the system/ technology capabilities and limitations

Things to consider

- Lack of socialization opportunities
- How is assessment/ reassessment performed?
- Need good follow-up from therapists/providers
- Inability to do hands-on therapy
- Asynchronous vs. synchronous monitoring
- Confidentiality
- Safety



- Technology issues
- Learning curve
- Use of complex treatment and monitoring devices (robotic devices etc.)
- Characteristics of the games/activities/exercises



- Health-care funding and policy
- Who are the providers??
- Scientific evidence
- Acceptability by patients and providers



Where next??

- Advertise the benefits
- Address the barriers
- Coordinate the systems
- Continue the research

**Deliver the right
care, in the right
place,
at the right time.**



Virtual reality (VR)

- ▶ VR involves the simulation of an environment with which the patient can interact.
- ▶ Varies from immersive VR systems (headsets) to simple games on computer screen
- ▶ Probably used most in **Exergames**



Virtual reality (2)

- ▶ Principles of VR based on sensory–motor practice, adaptive learning, modulating brain reorganisation through visual, somatosensory and auditory feedback
- ▶ Improves motor learning via watching own avatar

- ▶ In upper limb rehab VR can be combined with instrumented gloves with sensors, accelerometers, vibration etc for haptic feedback

Pros and Cons of VR systems

- ▶ Increases motivation and possible distraction
- ▶ Some cheap home based options eg Wii
- ▶ Can provide 'natural' situations (shopping) or distorted reality
- ▶ Studies show better or similar results to conventional rehab but greater adherence
- ▶ Evidence of improvement in eg. arm movement, balance, walking
- ▶ Not clear if exercise is at sufficient intensity for health benefits
- ▶ No consensus on duration/frequency/games etc
- ▶ Not specific to needs of people with MS
- ▶ Novelty might wear off
- ▶ Limited evidence base currently
- ▶ Cost?

Pros

Cons