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Use of Distance Delivery Interventions (Web-based, mHealth, Telehealth) for Hard-to-Reach, Vulnerable Midlife and Older Individuals

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College of Allied Health Professions



Disclaimer

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- Carol H Pullen, RN, EdD
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Panelists



- Lindy Clemson, PhD
- Sara Wilcox, PhD

Linkages

- Complimentary Health Promotion approaches
- Conceptual Frameworks
- Interprofessional
- Community



Goal Stretch our Thinking!





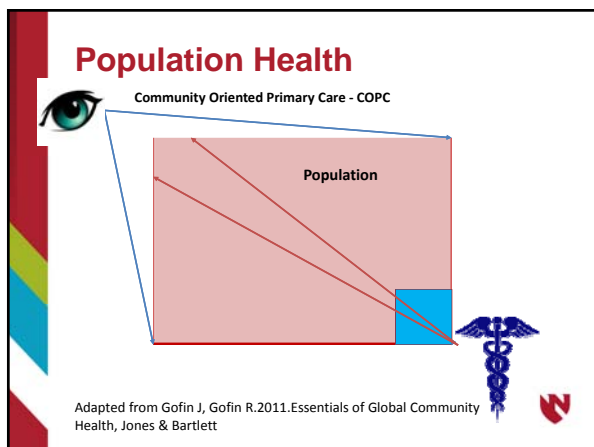
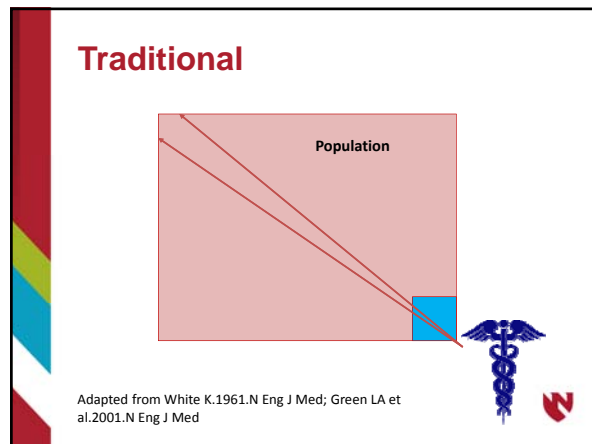
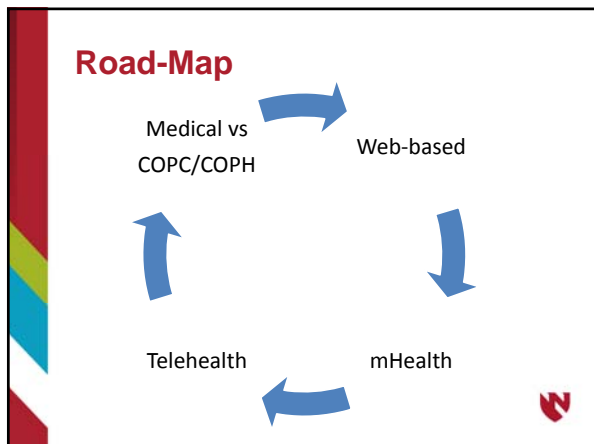
Objectives

Distance Delivery Interventions For Hard to Reach, Vulnerable Midlife and Older Individuals

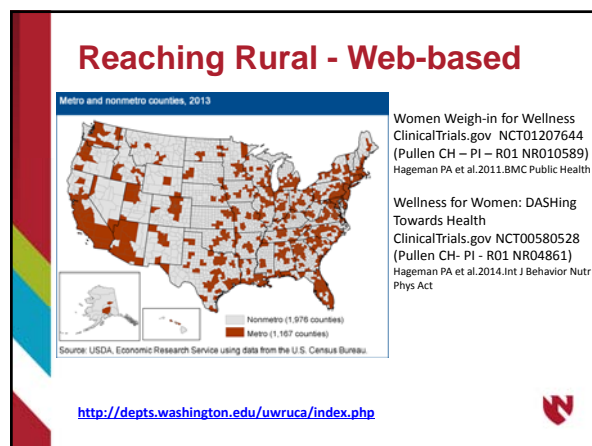
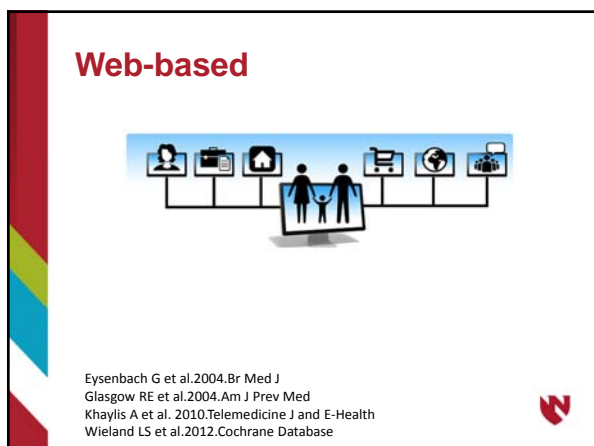
The learner will be able to:

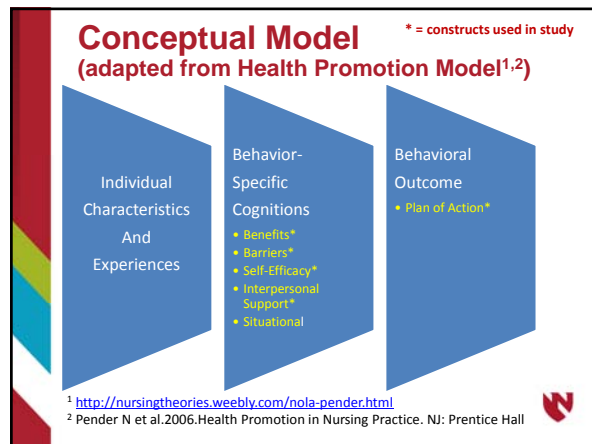
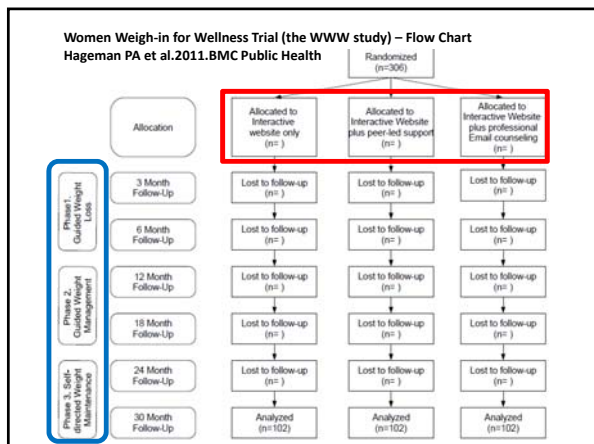
- 1) Identify benefits and limitations of various technologies for use with the identified population.
- 2) Discuss literature findings about feasibility, acceptability, effectiveness of distance delivery interventions for self-monitoring, safety and behavior change in the identified population.
- 3) Identify regulatory and other concerns when using telehealth and other distance delivery technologies for managing patient/client care.





- ### Technology Definitions
- (See Glossary with references)
- eHealth
 - web-based
 - mHealth
 - Telehealth
 - Synchronous/Asynchronous (store and forward/home monitoring)
 - Telemedicine
 - Telerehabilitation
- Note for researchers - eCONSORT
Eysenbach G & CONSORT EHEALTH GROUP.2011.J Med Internet Res





Phase 1 Web-based Intervention

University of Nebraska Medical Center

Welcome! You are currently in **Week 6**

Women Weigh-in For Wellness

TRACK MY PROGRESS

Average Steps Per Day test

Week	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
132	1200	1200	1200	1200	1200	1200	1200

PLAN so you can stick to the plan. Now is a good time to do serious PLANNING to keep a positive momentum for weight loss. Planning is a very mindful weight loss activity, especially beneficial for busy women. This week, focus on developing your own PERSONAL PLAN for successful weight loss and lifelong maintenance.

www.womenweighin.org

Phase 2 & 3 Web-based Examples

University of Nebraska Medical Center

Welcome! You are currently in **Week 236 (12/18 - 12/22)**

Women Weigh-in For Wellness

TRACK MY PROGRESS

Activity

During the week I think, did you do moderate activities for at least 10 minutes at a time, such as fast walking, swimming, aerobics, or anything else that causes rapid increase of breathing or heart rate and makes you sweat?

Hot Topics

Happy Holidays! AND keep them healthy, not SAD! Click to read: [Santa List to Go: Check Your List!](#)

The WOW Club!

Watch a shopping weight training video.

www.womenweighin.org

Discussion Board Group - Example

University of Nebraska Medical Center

Welcome! You are currently in **Week 9 (12/10 - 12/16)**

Discussion Board

Welcome 8902

Click here to watch a video tutorial.

The Big H: Maintenance, Here We Come!

Hi! Hello! Believe it or not, this is our last discussion topic for Phase 1. You've made it through 6 months... twenty six weeks... half a year of the WWW plan. I'm impressed! You're still here and still working hard to adopt new, best...

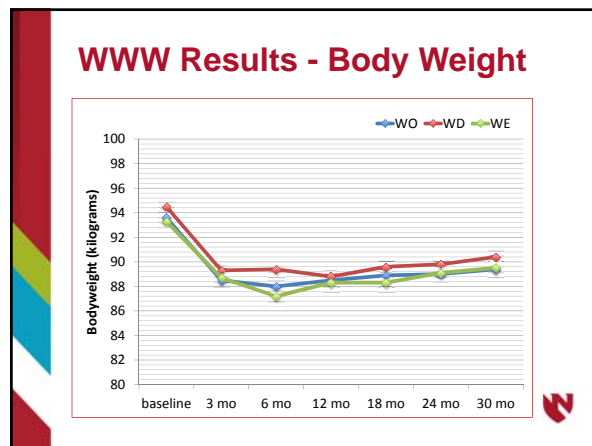
Pitfalls to Avoid: The All or Nothing Trap

Hello! Week 25 is here and we are gearing up to move on to Phase II. As we get ready to make this transition, I'd like to encourage you to avoid an obstacle that I myself have encountered many times: The All or Nothing Trap. We've...

Moving Toward Phase II: Let's Discuss!

Hi! Hello! Welcome you are at Week 24. We have a wonderful program on the web and the best way to come on and work to move to Phase...

www.womenweighin.org





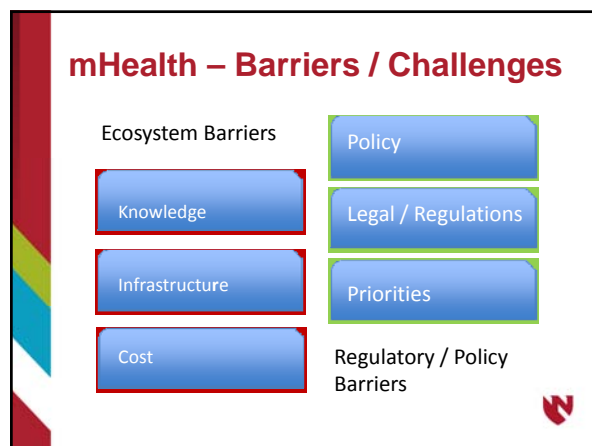
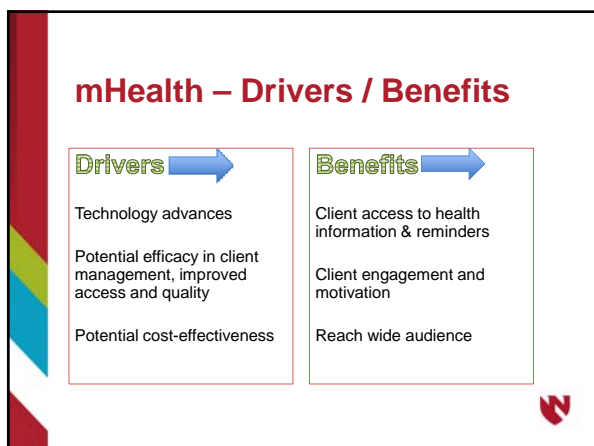
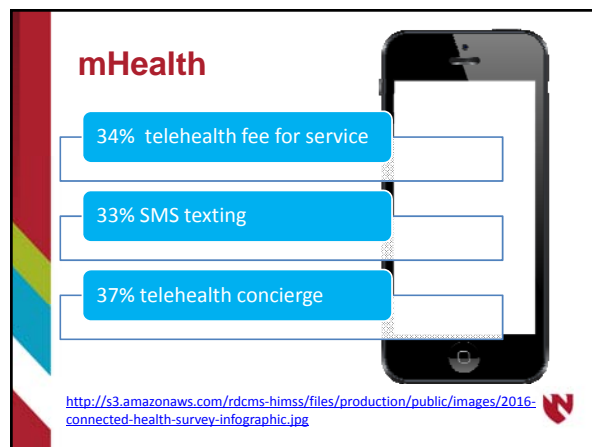
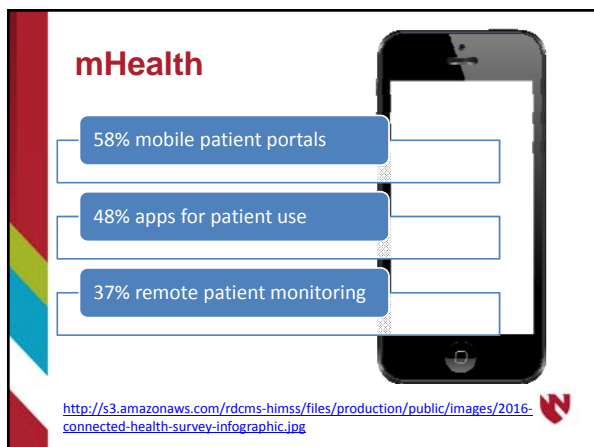
Discussion/Implications

Despite limitations, web-based interventions have potential for changing behavior.

Consider other implications – patient perspectives about health provider

Note APTA private practice section
<http://http://www.privatepracticesection.org/fit-factor/>

Neve M et al. 2010. Obes Reviews
 Perri MG et al. 2008. Arch Intern Med
 Wieland LS. 2012. Cochrane Database Systematic Reviews



mHealth

Research Learning

Apps tracking and managing conditions

SMS (text) Reminders
Talking provider
Refills

Consumer Use of Mobile Phones for Health

mHealth Rural Men Study

Men Needed

The Rural Men's Health Study...

Becker BJ et al. 2016. Cardiopulm Phys Ther Journal, pg 30

mHealth and Behavior Change

Monitors with apps

- May be less powerful than face-to-face
- May have greater public health impact
- Half of electronic activity monitor systems had
 - Goal setting
 - Social support & comparison
 - Prompts/cues
 - Reward & focus on past success
- Missing
 - Practice
 - Action plans & problem solving
- What is potential for rehabilitation?

Lyons EJ et al. 2014. JMedInternetResearch

Telehealth

(Goes beyond web & phone)

Telehealth (Regulations)

Telehealth operates across state lines
Knowing state and federal regulations is important

Laws and regulations are constantly changing – Vigilance helps compliance

Calouro C et al. 2014. Int J Telerehabilitation
Bremner D et al. 2010. Int J Telerehabilitation

Telehealth (Payment Issue)

- Medicare does not cover PT/OT/Speech
- Medicaid is leading use of telehealth as covered services
- Other plans – some pay and some do not

Wilson. 2016. J Telem Telecare
Thomas L, Capistrant G. 2015. American Telemedicine Association.
www.americantelemed.org

Telehealth Resources (www.apta.org)



<http://www.apta.org/Telehealth/>

- Legislation and Regulation
- Risk Management Considerations
- Billing and Coding Considerations
- Telehealth in Practice
- Telehealth Into PT Education
- Research Opportunities

Telehealth Resources (www.fsbpt.org)



<https://www.fsbpt.org/FreeResources/RegulatoryResources/TelehealthinPhysicalTherapy.aspx>

Lessons learned (Physician use)

- Rapid explosion of laws
- Guidelines – limited or not-consistent
- Reimbursement less than office visit
- Online patient interactions do not affect in person physician frequency
- Studies underway

Wilson F et al. 2016. J Telemedicine Telecare
North F et al. 2014. Telemedicine and e-Health
See reference list for additional sources

Lessons learned (Plans-Private)

- Rapid explosion in plans offering telemedicine
- 73% offer nurse coaching for lifestyle management
- Employers view telemedicine consultations as low cost alternative; current use is low
- Retail based clinics dramatically expand telemedicine care – though controversial

Medscape. 2015. Survey results from National Business Group on Health
See reference list for additional sources

Lessons learned (Current research – rehabilitation)

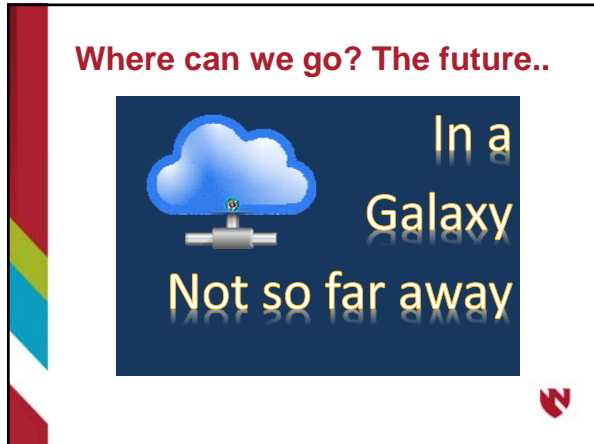
- Feasible alternative to in-person encounters for meeting PT supervision requirements in SNF
- Effective in other populations (TKA, MS, Stroke)
- Validity and reliability of assessment
- No specific CPT codes
- As noted by Lee & Brown
 - All telehealth is not same
 - Practitioners should establish standard of care

Lee AC, Brown, CA. 2015. APTA Learning Center Module
Lee AC, Harada NH. 2012. Phys Ther
Mani S, et al. 2016. J Telemedicine and Telecare
See reference list for additional sources

Summary

- Rapid advances technology
- Literature
 - Infancy
 - Benefits / Barriers
- Tools
 - Behavior change
 - Interprofessional
 - Merits at individual / public health levels

Hageman PA. 2016. http://digitalcommons.unmc.edu/cahp_pt_pres/1/



Glossary

Highlighted in ExPAAC II Presentation July 27-30, 2016. Hageman PA: Use of distance delivery interventions (web-based, mHealth, telehealth) for hard-to-reach, vulnerable midlife and older individuals.

e-health E-health is an emerging field in the intersection of medical informatics, public health and business, referring to health services and information delivered or enhanced through the internet and related technologies. In broader sense the term characterizes not only a technical development but a state of mind, a way of thinking, an attitude, and a commitment for networked, global thinking, to improve health care locally, regionally and worldwide by using information and communication technology.

Ref: Eysenbach G. What is e-health? J Med Internet Res 2001;3(2):e20
<http://www.jmir.org/2001/2/e20/> doi:10.2196/jmir.3.2.e20

mHealth* 1) mHealth is "the delivery of healthcare services via mobile communication devices"

Ref: Foundation for the National Institutes of Health (FNIH)
www.caroltorgan.com/mhealth-summit/

2) "mHealth is the use of mobile and wireless devices to improve health outcomes, healthcare services and health research."

Ref: National Institutes of Health Consensus Group mHealth. [2013-03-25].
<http://www.hrsa.aquilentprojects.com/healthit/mhealth.html>

3) "Mobile Health (mHealth) is an area of electronic health (eHealth) and it is the provision of health services and information via mobile technologies such as mobile phones and Personal Digital Assistants (PDAs)."

Ref: World Health Organization (WHO)
<http://www.who.int/tb/areas-of-work/digital-health/definitions/en/>

4) "mHealth stands for mobile-based or mobile-enhanced solutions that deliver health. The ubiquity of mobile devices in the developed or developing world presents the opportunity to improve health outcomes through the delivery of innovative medical and health services with information and communication technologies to the farthest reaches of the globe."

Ref: The mHealth Alliance
<http://www.mhealthknowledge.org/resource-type/mhealth-alliance>

5) mHealth is "The use of mobile networks and devices in supporting e-care. Emphasizes leveraging health-focused applications on general-purpose tools such as smartphones and Short Message Service (SMS) messaging to drive active health participation by consumers and clinicians."

Ref: US Broadband Plan <http://download.broadband.gov/plan/national-broadband-plan-chapter-10-health-care.pdf>

Telehealth Telehealth is the use of electronic communications to provide and deliver a host of health-related information and health care services, including, but not limited to physical therapy-related information and services, over large and small distances. Telehealth encompasses a variety of health care and health promotion activities, including, but not limited to, education, advice, reminders, interventions, and monitoring of interventions.

Ref: APTA Board of Directors TELEHEALTH - DEFINITIONS AND GUIDELINES BOD G03-06-09-19 [Retitled: Telehealth; Amended BOD G03-03-07-12; Initial BOD 11-01-28-70] [Guideline]

Telemedicine Use of medical information exchanged from one site to another via electronic communications to improve a patient's clinical health status. Telemedicine includes a growing variety of applications and services using two-way video, email, smart phones, wireless tools and other forms of telecommunications technology.

Telerehabilitation refers to the delivery of rehabilitation services via information and communication technologies. Clinically, this term encompasses a range of rehabilitation and habilitation services that include assessment, monitoring, prevention, intervention, supervision, education, consultation, and counseling.

Synchronous: Interactive video connections that transmit information in both directions during the same time period.

Asynchronous: Term describing store and forward transmission of medical images and/or data because the data transfer takes place over a period of time, and typically in separate time frames. The transmission typically does not take place simultaneously. This is the opposite of synchronous.

Ref: American Telemedicine Association <http://www.americantelemed.org/about-telemedicine/what-is-telemedicine#.V2RViqJFOwh>

*Definitions of mHealth are listed randomly, not by any level of meaning or relevance

REFERENCES/Bibliography

ExPAAC II Presentation July 27-30, 2016. Hageman PA: Use of distance delivery interventions

Annecharico MA. 2016. The Implementation of Mobile Computing in Health Care. CIO Review. Accessed at <http://healthcare.cioreview.com/cxoinsight/The-Implementation-of-Mobile-Computing-in-Health-Care-nid-3803-cid-31.html>

Black JT, Romano PS, Sadeghi B, et al. 2014. A remote monitoring and telephone nurse coaching intervention to reduce readmissions among patients with heart failure: study protocol for the Better Effectiveness After Transition - Heart Failure (BEAT-HF) randomized controlled trial. *Trials*. 15:124, April 13, 2014

Becker B, Eisenhauer CM, Pullen CH, Dizona PL, Hageman PA. 2016. Feasibility of mhealth technology use among a sample of isolated rural men at high risk for cardiovascular disease. *Cardiopulmonary Phys Ther Journal*. 27(1):30.

Bonomi AG, Westerterp KR. 2011. Advances in physical activity monitoring and lifestyle interventions in obesity: a review. *Int J Obesity*. 36, 167-177. Doi:10.1038/ijo.2011.99

Bremner D, Tindall L, Theodoros D, et al. 2010. A blueprint for telerehabilitation guidelines. *International J Telerehab*. 2(2):31-34.

Brindal E, Freyne J, Saunders I, et al. 2012. Features predicting weight loss in overweight or obese participants in a web-based intervention: randomized trial. *J Med Internet Res*. 14:e173.

Calouro C, Kwong MW, Gutierrez M. 2014. An analysis of state telehealth laws and regulations for occupational therapy and physical therapy. *Int J Telerehabilitation*. 6(1) :e17 DOI 10.5195/ijt.2014.6141

Chumbler NR, Quigley P, Li X, et al. 2012. Effects of Tele-rehabilitation on physical function and disability for stroke patients: a randomized, controlled trial. *Stroke*. 43(8):2168-74.

Daniel H, Sulmasy LS, & Health and Public Policy Committee of the American College of Physicians. 2015. Policy recommendations to guide the use of telemedicine in primary care settings: an American College of Physicians position paper. *Ann Intern Med*. Sep 7. Doi:10.7326/M15-0498

De Leo G, Brivio E, Sautter SW. 2011. Supporting autobiographical memory in patients with Alzheimer's disease using smart phones. *Appl Neuropsychol*. 18(1):69–76.

Deloitte. Annual Checkup on Physician Adoption of Health IT. September 2014. Accessed at: <http://deloitte.wsj.com/cio/2014/10/08/annual-checkup-on-physician-adoption-of-health-it/>

Digitas. m.Book: Marketing Mobile Health, 2013 Edition
http://www.publicishealthcare.com/Libraries/News_Documents/Digitas_Health_-_mBook_2012_pdf.sflb.ashx

Durso SC, Wendel I, Letzt AM, et al. 2003. Older adults using cellular telephones for diabetes management: a pilot study. *Medsurg Nurs*. 12(5):313–317.

REFERENCES/Bibliography

ExPAAC II Presentation July 27-30, 2016. Hageman PA: Use of distance delivery interventions

Eysenbach G. 2001. What is e-health? J Med Internet Res 3(2):320 Doi: 10.2196/jmir.3.2.e20.

Eysenbach G, CONSORT-EHEALTH Group. 2011. CONSORT-EHEALTH: improving and standardizing evaluation reports of Web-based and mobile health interventions. J Med Internet Res. 13:e126.

Eysenbach G, Powell J, Englesakis M, Rizo C, Stern A. 2004. Health related virtual communities and electronic support groups: systematic review of the effects of online peer to peer interactions. British Medical Journal. 328:1166-9.

Finkelstein J1, Lapshin O, Castro H, Cha E, Provance PG. 2008. Home-based physical telerehabilitation in patients with multiple sclerosis: A pilot study. J Rehabil Res Dev. 45(9):1361-1373.

FluView Influenza-like Illness Activity Mobile Application. Center for Disease Control and Prevention. <http://www.cdc.gov/flu/apps/fluview-mobile-app.html> Updated April 27th, 2015.

Glasgow RE, Bull SS, Piette JD, Steiner JF. 2004. Interactive behavior change technology. A partial solution to the competing demands of primary care. Am J Prev Med. 27:80-7.

Green LA, Fryer GE, Yawn BP, Lanier D, Dovey SM. 2001. The Ecology of Medical Care. N Eng J Med 344(26): 2021-2024.

Health Services Resources Administration (HRSA) . 2015. Telehealth.

<http://www.hrsa.gov/healthit/toolbox/RuralHealthITtoolbox/Telehealth/whatistelehealth.html>

Gofin J, Gofin R. 2011. Essentials of Global Community Health. Jones & Bartlett.

Gofin J, Gofin R, Stimpson JP. 2015. Community-oriented primary care (COPC) and the affordable care act: an opportunity to meet the demands of an evolving health care system. J Prim Care Community Health. Apr;6(2):128-33. doi: 10.1177/2150131914555908. Epub 2014 Oct 28.

Hageman PA, Pullen CH, Hertzog M, Boeckner LS, Walker SN. 2011. Web-based interventions for weight loss and weight maintenance among rural midlife and older women: protocol for a randomized controlled trial. BMC Public Health. Jun 30;11:521. doi: 10.1186/1471-2458-11-521.

Hageman PA, Pullen CH, Hertzog M, Boeckner LS. 2014. Effectiveness of tailored lifestyle interventions, using web-based and print-mail, for reducing blood pressure among rural women with prehypertension: main results of the Wellness for Women: DASHing towards Health clinical trial. Int J Behav Nutr Phys Act. Dec 6;11:148. doi: 10.1186/s12966-014-0148-2.

Healthcare Information and Management Systems Society (HIMSS) <http://www.himss.org/>

Joe J, Demiris G. 2013. Older adults and mobile phone for health: a review. J Biomed Inform. 46(5):947-954.

Johnsen M. 2014. Almost 80% of Americans would consider a virtual visit with their healthcare professional. The Harris Poll. November 19, 2014

REFERENCES/Bibliography

ExPAAC II Presentation July 27-30, 2016. Hageman PA: Use of distance delivery interventions

Khaylis A, Yiaslas T, Bergstrom J, Gore-Felton C. 2010. A review of efficacious technology-based weight-loss interventions: five key components. *Telemed J E Health*. 16:931-8.

King AC, Hekler EB, Grieco LA, et al. 2013. Harnessing different motivational frames via mobile phones to promote daily physical activity and reduce sedentary behavior in aging adults. *PLoS ONE*. 13;8(4):e62613.

Lee AC, Billings M. 2016. Telehealth implementation in a skilled nursing facility: A case report for physical therapist practice in Washington. *Phys Ther*. Feb;96(2):252-9. doi: 10.2522/ptj.20150079. Epub 2015 Dec 10

Lee AC, Brown CA. 2015. Practical Application of Telehealth. APTA Learning Center Module.

Lee, AC, Harada NH. 2012. Telehealth as a means of health care delivery for physical therapist practice. *Phys Ther*. 92:463-468.

Lee AC, Parmanto B, Saptono A, et al. 2012. The VISYTER Telerehabilitation System for Globalizing Physical Therapy Consultation: Issues and challenges for telehealth implementation. *J Phys Ther Educ*. 26(1):90-96.

Lee DL. 2016. Mobile health in older adults: benefits and barriers. *Geriatrics*. Nov 15;22(6):8-11.

Lee RYW, Carlisle AJ. 2011. Detection of falls using accelerometers and mobile phone technology. *Age Ageing*. 40(6):690–696.

Levy H, Janke A, Langa KM. 2014. Health Literacy and the Digital Divide Among Older Americans. *J Gen Intern Med*. Mar;30(3):284-9. doi: 10.1007/s11606-014-3069-5. Epub 2014 Nov 12.

Lim S, Kang SM, Shin H, et al. 2011. Improved glycemic control without hypoglycemia in elderly diabetic patients using the ubiquitous healthcare service, a new medical information system. *Diabetes Care*. 34(2):308–313.

Lyons EJ, Zakkoyva ZH, Mayrsohn BG, Rowland RL. 2014. Behavior change techniques implemented in electronic lifestyle activity monitors: A systematic content analysis. *J Med Internet Res*. 16(8): e192. Doi: 10.2196/jmir.3469

Mani S, Sharma S, Omar B, Paungmali A, Joseph L. 2016. Validity and reliability of Internet-based physiotherapy assessment for musculoskeletal disorders: A systematic review. *Journal of Telemedicine and Telecare*. Mar 31 0(0)1-13. Doi. 10.1177/1357633X16642369

Marshall SG, Shaw DK, Honles GL, et al. 2008. Interdisciplinary approach to the rehabilitation of an 18-year-old patient with bronchopulmonary dysplasia, using telerehabilitation technology. *Respir Care*. 53:346-350.

REFERENCES/Bibliography

ExPAAC II Presentation July 27-30, 2016. Hageman PA: Use of distance delivery interventions

Monroe CM, Thompson DL, Bassett D, et al. 2015. Usability of Mobile Phones in Physical Activity–Related Research: A Systematic Review. *Am J Health Education*. 46(4): 196-206.

Most large employers will offer telemedicine, study shows. *Medscape*. Aug 24, 2015. (Summary of survey results from the National Business Group on Health and from Towers Watson)

National Conference of State Legislatures. 2015. Telehealth policy trends and considerations. www.ncsl.org/documents/health/telehealth2015.pdf

Neve M, Morgan PJ, Jones PR, Collins CE. 2010. Effectiveness of web-based interventions in achieving weight loss and weight loss maintenance in overweight and obese adults: a systematic review with meta-analysis. *Obes Rev*. 11:306-21.

North F, Crane S, Chaudhry R, et al. 2014. Impact of patient portal secure messages and electronic visits on adult primary care office visits. *Telemedicine and e-Health*. 20(3): 192-198.

Perri MG, Limacher MC, Durning PE, et al. 2008. Extended-care programs for weight management in rural communities: the treatment of obesity in underserved rural settings (TOURS) randomized trial. *Arch Intern Med*. 168:2347-54.

Peterson C, Watzlaf V. 2014. Telerehabilitation store and forward applications: A review of applications and privacy considerations in physical and occupational therapy practice. *International J Telerehab*. 6(2):75-84. Doi. 10.5195/ijt.2014.6161

Pew Research Center, November 2012 Mobile Health 2012. <http://www.pewinternet.org/2012/11/08/mobile-health-2012/>

Pew Research Center, April 2014. Older Adults and Technology Use. <http://www.pewinternet.org/2014/04/03/older-adults-andtechnology-use/>

Pew Research Center, April 2015. U.S. Smartphone Use in 2015. <http://www.pewinternet.org/2015/04/01/us-smartphoneuse-in-2015/>

Piron L, Turolla A, Agostini M, et al. 2009. Exercises for paretic upper limb after stroke: a combined virtual-reality and telemedicine approach. *J Rehabil Med*. Oct 1;41(12):1016-20.

Rees RS, Bashshur N. 2007. The effects of telewound management on use of services and financial outcomes. *Telemed e-Health*. 13: 663-674.

Rimmer JH, Wang E, Pellegrini CA, et al. 2013. Telehealth weight management intervention for adults with physical disabilities: A randomized controlled trial. *Am J Phys Med Rehabil* 92:1084-1094.

REFERENCES/Bibliography

ExPAAC II Presentation July 27-30, 2016. Hageman PA: Use of distance delivery interventions

Russell TG, Buttrum P, Wootton R, Jull GA. 2004. Total knee replacement rehabilitation via low-bandwidth telemedicine: The patient and therapist experience. *J Telemedicine Telecare*. 10:78-85.

Russell TG, Buttrum P, Wootton R, et al. 2011. Internet-based outpatient telerehabilitation for patients following total knee arthroplasty: A randomized controlled trial. *J Bone Joint Surg Am*. 93:113-120.

Russell T, Hoffmann T, Nelson M, Thompson L, Vincent A. 2013. Internet-based physical assessment of people with Parkinson disease is accurate and reliable: A pilot study. *J Rehabil Res Dev* 50 5: 643-650.

Shaya FT, Chirikov VV, Howard D, et al. 2014. Effect of social networks intervention in type 2 diabetes: a partial randomized study. *Journal of Epidemiology and Community Health*. Apr;68(4):326-32

Silva GS, Farrell S, Shandra E, Viswanathan A, Schwamm LH. 2012. The status of telestroke in the United States. *Stroke*. 43:2078-2085.

Skinner C, Finkelstein J. 2008. Using cell phones for chronic disease prevention and management. *AMIA Annu Symp Proc*. Nov 6:1137.

Stoyanov SR, Hides L, Kavanagh DJ, Zelenko O, Tjondronegoro D, Mani M. 2015. Mobile app rating scale: a new tool for assessing quality of health mobile apps. *JRMI hHealth uHealth*. 3(1):e27.

Thomas L, Capistrant G. 2015. State Telemedicine Gaps Analysis Coverage and Reimbursement. American Telemedicine Association. http://www.americantelemed.org/docs/default-source/policy/2016_50-state-telehealth-gaps-analysis--coverage-and-reimbursement.pdf

Tousignant M, Moffet H, Boissy P, et al. 2011. A randomized controlled trial of home telerehabilitation for post-knee arthroplasty. *J Telemed Telecare*. 17(4):195-198.

Tousignant M, Moffet H, Nadeau S, et al. 2015. Cost analysis of in-home telerehabilitation for post-knee arthroplasty. *J Med Internet Res*. Mar 31;17(3):e83. doi: 10.2196/jmir.3844.

Truter P, Russell T, Fary R. 2014. The validity of physical therapy assessment of low back pain via telerehabilitation in a clinical setting. *Telemedicine and e-Health*. 20(2): 161-167.

Tullidge T. 2015. Telehealth and investors: the Future? The Robert J. Waters Center for Telehealth and e-Health Law (CTeL). <http://ctel.org/2015/11/telehealth-and-investors-the-future-ctel-executive-summit/>

Wieland LS, Falzon L, Sciamanna CN, et al. 2012. Interactive computer-based interventions for weight loss or weight maintenance in overweight or obese people. *Cochrane Database Syst Rev*. 2012;8:CD007675.

REFERENCES/Bibliography

ExPAAC II Presentation July 27-30, 2016. Hageman PA: Use of distance delivery interventions

Wilson FA, Rampa S, Trout KE, Stimpson JP. 2016. Reimbursements for telehealth services are likely to be lower than non-telehealth services in the United States. J Telemed Telecare. Jun 3. pii: 1357633X16652288. [Epub ahead of print]

Veterans Administration <http://www.telehealth.va.gov/index.asp>

International Journal of Telehealth <http://telerehab.pitt.edu/ojs/index.php/Telerehab/issue/view/250>