

Telehealth curricula in graduate physical therapy education.

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Abstract

Telehealth physical therapy quickly became accepted and utilized during the COVID-19 pandemic. Telehealth efficacy has been established in medical practice and is an integral component to graduate medical education. While the effectiveness of telehealth in physical therapy has been proven, telehealth curricula in physical therapy graduate education have not been adequately studied. The purpose of this quantitative descriptive study was to explore the association between telehealth curricula in physical therapy graduate education. A quantitative and descriptive cross-sectional survey of 31 physical therapists was utilized. A cross-sectional survey was adapted, utilizing a Likert-type scale to assess knowledge and attitude inferential statistics were used to evaluate knowledge and attitudes regarding telehealth. Telehealth exposure included no exposure (25.8%), one lecture (54.8%), a lecture series/several lectures (12.9%), and an entire course (6.5%). Mean knowledge pre- and post-curricula were 1.52 and 2.75 ($p < 0.001$). Mean attitudes regarding telehealth pre- and post-curricula were 2.53 and 3.64 ($p < 0.001$). While graduate physical therapy educational programs continue to adapt to needed changes in curricula, telehealth curricula remain underdeveloped and underutilized. Current telehealth curricula do seem to improve physical therapists' knowledge and attitudes regarding telehealth. Increased uptake of telehealth curricula in didactic education could better prepare physical therapists to utilize telehealth.

Keywords: Telehealth, Physical therapy, Curriculum, Education.

Introduction

Telehealth is the delivery of remote healthcare using telecommunications such as video and has been found to be a cost-effective and high-quality option to deliver physical therapy care [1]. Telehealth offers essential health services to remote and underserved populations, who suffer from inadequate access to care. Although the efficacy of telehealth services in physical therapy has been well established, a lack of telehealth coverage by many insurance companies and the view of many physical therapists that telehealth is not practical have remained barriers to increased telehealth adoption in physical therapy [2, 3]. Changes in medical practice regarding telehealth may serve as a model to implement telehealth more effectively into physical therapy practice. Telehealth in medical specialties is effective, including in neurology [4] and internal medicine [5]. The COVID-19 pandemic necessitated graduate medical education curricula to focus on telehealth implementation and optimization. Ha et al. found that family medicine residents were more confident regarding the use of telehealth in practice and argued that telehealth should be included in the medical resident curricula [6]. Telehealth curricula were also found to improve knowledge, comfort, and perception of telehealth use in medical residents

[5]. Third-year medical students found telehealth curricula improved perceived knowledge of telehealth, where 80% planned to implement it into their practice [7]. Brookes et al. and Walker et al. found that medical students were more confident about their knowledge and skills to use telehealth later in medical practice [8, 9]. However, some contrasting evidence showed that graduate physical therapy students view telehealth as less useful even after participating in structured telehealth curricula [2]. These findings suggest that although the telehealth curricula in physical therapy education could be valuable, curricula may require additional research and improvements to better address barriers.

Efficacy of telehealth services and telehealth curriculum

Azma et al. found telehealth and in-clinic treatment for knee osteoarthritis to have similar pain and function outcomes at a 6-month follow up [10]. In-person and telehealth knee pain assessment have also been found to agree in 94% of cases, with high intra-rater (89%) and moderate inter-rater (67%) reliability compared to in-person assessment [11]. Mbada et al. found the McKenzie treatment approach for low back pain was equally effective at decreasing pain and improving

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function when comparing telehealth to in-clinic delivery [12]. Additionally, it has been found that in-person and telehealth assessments to categorize distinct categories of low back pain were similar when comparing the two groups [13]. Asynchronous physical therapy delivered remotely was discovered to result in similar patient satisfaction, pain ratings, and function compared to in-clinic physical therapy [14]. In a stroke population, arm strength and patient stroke knowledge were similar after stroke rehabilitation in-clinic compared to telehealth [15]. Though the efficacy of telehealth in physical therapy has been well established, little research has explored the prevalence or effectiveness of telehealth curricula in graduate physical therapy education.

Randall et al. discovered that graduate physical therapy students perceived telehealth services as less useful and less easy to use than in-person services. After delivering the telehealth curricula, physical therapy students felt more knowledgeable regarding the topic but continued to perceive telehealth as less valuable option to provide services [2]. Physical therapy students and professors have suggested similar barriers to the implementation of telehealth in physical therapy, including lack of evidence for telehealth, negative attitudes regarding telehealth, and lack of knowledge regarding telehealth [3].

Previous telehealth curricula in graduate physical therapy education have not effectively improved knowledge or perceived usefulness of telehealth services [2,3]. The barriers to improved knowledge regarding telehealth and perceived usefulness of telehealth are likely specific to physical therapy as the efficacy of telehealth curricula in medical education is well established [6, 9]. The different requirements of graduate physical therapy students may be addressed by better understanding the distinct needs of the telehealth curricula in graduate physical therapy education.

Many rural areas have inadequate quality of or insufficient access to healthcare services [16]. These inadequate and insufficient services contribute to health disparities of rural populations, creating a need for services such as telehealth physical therapy to improve access to quality care. Early in the COVID-19 pandemic, telehealth quickly became the primary medium for medical services as physicians and other healthcare providers quickly shifted to providing remote services [1]. Although the pandemic increased use of telehealth in physical therapy, barriers do remain in physical therapy including low acceptance, knowledge, and viewed usefulness. By better understanding this association, students may gain knowledge and acceptance of telehealth, leading to increased use and greater access to underserved populations. This study will help clarify the association of telehealth curricula to outcomes in the realm of physical therapy by examining the prevalence of telehealth curricula in physical therapy graduate education and its impact on telehealth knowledge and attitudes. The purpose of this quantitative descriptive study was to explore the association between telehealth curricula in graduate physical therapy education and recent physical therapy graduates perceived knowledge and attitudes regarding telehealth.

Methods

A quantitative, descriptive, cross-sectional research design was used to examine telehealth curricula in physical therapy graduate education. A descriptive design allowed assessment of the sample population, recent graduate physical therapists, at a specific point in time. Specifically, a cross-sectional survey was used to examine knowledge and attitudes.

Study participants

Potential participants were located using the Oregon–American Physical Therapy Association membership email list, which includes licensed physical therapists in the state of Oregon. Inclusion criteria of participants were defined as: must (a) be a physical therapist; (b) have graduated in the last 5 years; (c) have had exposure to telehealth curriculum in his or her graduate physical therapy education. Exclusion criteria of participants included: (a) not a physical therapist; (b) graduated more than 5 years ago; (c) did not have exposure to telehealth curriculum in his or her graduate physical therapy education. A cover letter introduced participants to the study and included information about the anonymity of the survey, time commitment, and purpose of the research.

Sampling methodology

Non-probability, convenience sampling was used to sample members of the Oregon–American Physical Therapy Association. Convenience sampling allowed for sampling of more of the total population. Since convenience sampling lacks true random sampling the limit the ability to make inferences from collected data.

Survey development

The survey instrument was adapted from previous work by Walker et al. which explored medical student thoughts and feelings regarding telehealth before and after delivery of telehealth curricula. It was adapted to use physical therapy specific language. The survey included three demographic questions and before and after statements, which were identical survey statements including 11 phrases regarding telehealth knowledge and six statements of opinions regarding telehealth. Statements were formulated in positive language to indicate knowledge and positive attitudes. Agreement with each statement was ranked on a 0 to 5 Likert-scale, with 0 being disagree and 5 being completely agree. Walker et al. created the survey to examine the effects of curricula on telehealth knowledge and acceptance. This tool has not been validated and was adapted to suit physical therapy graduate education, as directed by the Survey Instruments and Validation document.

Data collection

Data were collected through Survey Monkey and stored in an SPSS database. Institutional review board approval was granted by the review board at A. T. Still University of Health Sciences. It was determined that external institutional review board and committee approval was not required. Important demographic data were collected and included years since graduation (0, 1, 2, 3, 4, or 5), education level (master's

or doctorate), and exposure to telehealth curriculum (no exposure, one lecture, one lecture series/several lectures, or entire course).

Statistical analysis

Demographic data including years since graduate and exposure level to telehealth curriculum were explored as moderating effects on variables of interest. The Shapiro-Wilk test was used to determine normality, using a = 0.05 criterion alpha level. The main outcome variables included differences between pre-curriculum and post-curriculum data. Subscales included pre- and post-curriculum data regarding knowledge and attitudes. Outcome variables included differences between pre-curriculum and post-curriculum data. Subscales included pre- and post-curriculum data regarding knowledge and attitudes, while data was also analyzed item-by-item. Data are displayed as means for each item, including a pre-curriculum, post-curriculum, and difference. A Wilcoxon test was used to compare the means of the pre-curriculum and post-curriculum data.

Results

Data from 51 participants were collected for the study and 31 participants had graduated within the past 5 years (60.7%), while 20 participants (39.2%) were excluded from the study due to graduating more than 5 years ago. All participants included in the study had a doctorate-level education (100%).

Participants' years since graduation are presented in Table 1. Eight participants graduated in the past year (25.8%), four

participants graduated 2 years prior (12.9%), four participants graduated 3 years prior (12.9%), eight participants graduated 4 years prior (25.8%), and seven participants graduated 5 years prior (22.6%). The median value for years since graduation was 3 years, while the smallest mode was 1 year since graduation and the range was 4. Participant exposure to telehealth is also presented in Table 1. Eight participants had no exposure to structured telehealth curricula (25.8%), 17 participants had one telehealth-focused lecture including digital didactic coursework (54.8%), four participants had a telehealth lecture series or several lectures including digital practical experience (12.9%), and two participants had an entire telehealth course (6.5%). The median and mode values for telehealth curricula exposure were one telehealth-focused lecture including digital didactic coursework, while the range was 4.

Knowledge

Participant self-assessment of knowledge pre- and post-telehealth curriculum is presented in Table 2, using a Likert-type scale with 1 being not knowledgeable and 5 being very knowledgeable. Values include the mean score before telehealth curricula, after telehealth curricula, and the difference between these two values. Participants felt least knowledgeable about the types of telehealth peripheral equipment (1.42 to 2.55) and most knowledgeable regarding how telehealth technology is used for delivering physical therapy care (1.65 to 2.97). The smallest difference in pre- and post-curriculum knowledge was regarding insurance reimbursement, designing an office that is conducive for telehealth visits, proper body language, and

Table 1. Participant graduation year and telehealth exposure.

Characteristics		Number (percentage)
Years Since Graduation	1 year	8 (25.8%)
	2 years	4 (12.9%)
	3 years	4 (12.9%)
	4 years	8 (25.8%)
	5 years	7 (22.6%)
Exposure to Telehealth	No exposure	8 (25.8%)
	One lecture	17 (54.8%)
Curriculum	(including digital didactic work) One lecture series/ several lectures (including digital practical experience)	4 (12.9%)
	Entire course	2 (6.5%)

Note. n=31.

Table 2. Telehealth knowledge pre- and post-curriculum.

	Pre-	Post-	Difference
How telehealth technology is used for delivering physical therapy care	1.65	2.97	1.32
Telehealth nomenclature	1.48	2.81	1.33
Insurance reimbursement in telehealth	1.45	2.58	1.13
State law regarding use of telehealth	1.48	2.65	1.17
The efficacy of telehealth	1.58	2.87	1.29
Ethical concerns associated with telehealth	1.55	2.87	1.32
Designing an office that is conducive for telehealth visits	1.58	2.71	1.13
Proper body language appropriate for telehealth visits	1.61	2.74	1.13
The steps in conducting a telehealth visit	1.48	2.87	1.39
The types of telehealth peripheral equipment	1.42	2.55	1.13
Operating telehealth peripheral equipment	1.45	2.61	1.16

Note. Mean scores pre- and post-curriculum on a Likert-type scale, where 0 indicates not knowledgeable at all and 5 indicates completely knowledgeable (n=31).

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Table 3. Telehealth attitudes pre- and post-curriculum.

	Pre-	Post-	Difference
Telehealth can be used as a cost saving mechanism	2.81	3.68	0.87
Telehealth will pay a very important role in the future of physical therapy	2.71	3.74	1.03
I would like to use telehealth in my future practice	2.58	3.58	1
I am comfortable conducting a patient encounter via telehealth	2.48	3.61	1.13
The quality of a telehealth visit is the same as an in-person visit	1.94	3.13	1.19
Telehealth has utility in a variety of physical therapy settings	2.65	4.1	1.45

Note. Mean scores pre- and post-curriculum on a Likert-type scale, where 0 indicates completely disagree and 5 indicates completely agree (n=31).

Table 4. Overall mean pre- and post-telehealth curriculum.

	Pre-	Post-	Difference
Knowledge	1.52	2.75	1.23*
Attitudes	2.53	3.64	1.11*

* $p < 0.001$.

types of peripheral equipment (1.13). The largest difference in pre- and post-curriculum knowledge was in the steps in conducting a telehealth visit (1.39).

Attitudes

Participant self-assessment of attitudes pre- and post-telehealth curriculum is presented in Table 3, using a Likert-type scale with 1 being disagree and 5 being agree. Values include the mean score before telehealth curricula, after telehealth curricula, and the difference between these 2 values. Participants disagreed most with the statement that the quality of telehealth visits are the same as in-person visits (1.94 to 3.13). Before telehealth curricula, participants agreed most with the statement that telehealth can be used as a cost saving mechanism (2.81), but after telehealth curricula agreed most with the statement that telehealth has utility in a variety of settings (4.10). The smallest difference in pre- and post-curriculum means was regarding the statement that telehealth can be used as a cost saving mechanism (0.87; Table 3). The largest difference in pre- and post-curriculum attitude was regarding the statement that telehealth has utility in a variety of settings (1.45).

The overall knowledge mean score before telehealth curricula was 1.52, while the score after curricula was 2.75 (Table 4). The difference between these scores was 1.23. The overall attitudes mean score before telehealth curricula was 2.53, while the score after curricula was 3.64. The difference between these scores was 1.11. The Wilcoxon test indicated a significant difference for both knowledge and attitude means after telehealth curricula ($p < 0.001$).

Discussion

The purpose of this study was to explore the association between telehealth curricula in graduate physical therapy education and recent physical therapy graduates perceived knowledge and attitudes regarding telehealth. Quantitative analysis found 74.2% of recent physical therapy graduates reported exposure to telehealth curricula in graduate education. Campbell et al. found a lower rate of exposure to telehealth curricula at 40.3% for physical therapy students, while only 16.6% of students reported participating in telehealth services. Students in early

clinical experiences reported feeling less confident compared to students in terminal clinical experiences, where growth in the student's clinical reasoning was implicated as an important contributor to improved confidence [17]. Analysis in this study and by Campbell et al. determined telehealth curricula in graduate physical therapy education had a significant effect on self-reported knowledge and attitudes regarding telehealth practice. This study also found that while curricula did have a significant impact on self-assessment of knowledge and attitudes, the impact varied from small to large for various components of telehealth. Similar trends have also been found in medical education where telehealth curricula have a variable effect on knowledge and attitudes [5, 6].

Recent Research

The current data suggested that telehealth curricula least effectively improved knowledge of insurance reimbursement, designing an office that is conducive to telehealth visits, proper body language, and types of peripheral equipment. This is similar to results by Davies et al. who found final year physical therapy students and recent graduates to be less confident in telehealth areas of technical skills and compliance issues [18]. Additionally, the current study found that telehealth curricula had the least impact on the attitude that telehealth could be used as a cost saving mechanism.

Study results indicated that telehealth curricula most effectively addressed the steps in conducting a telehealth visit and the attitude that telehealth could be used in a variety of settings. These results were similar to those found by Davies et al. where recent graduates and final year students were most confident in the delivery of telehealth services. Other areas where students and recent graduates were most confident included patient privacy, patient safety, assessment and diagnosis, and care planning and management [18]. The current study found similar trends with ethical concerns, but contrasted Davies et al. by finding a lower self-reported improvement in state laws regarding telehealth. It has also been found that as physical therapy students are exposed to more telehealth opportunities during clinical experiences, confidence in performing telehealth services improve [19]. No trend was found in the current study regarding increased

knowledge and attitudes for those physical therapists who were exposed to greater levels of telehealth curricula.

Recent research has also focused on which areas of telehealth curricula are most important to bolster knowledge and attitudes. A survey of recent graduate physical therapists suggested telehealth curricula may best improve practice by including telehealth curricula focused on physical assessment, verbal communication, and effective clinical reasoning [20]. A framework has been proposed which includes several domains important in telehealth curricula design: compliance, patient privacy and confidentiality, patient safety, technology skills, telehealth delivery, assessment and diagnosis, and care planning and management [21]. This framework and the results of the current study may have application in the development and design of future telehealth curricula.

Application

Theoretical application of results from this study and previous work by Martin et al. includes the need for telehealth curricula in graduate physical therapy education. First, the differences between in-clinic and telehealth must be understood, and then an effective curriculum can be developed to improve knowledge and attitudes regarding telehealth in physical therapy. Practical applications of these results include areas where telehealth curriculum has generally been ineffective. Weaknesses in curricula included not adequately addressing how to create an office conducive to telehealth visits, proper body language, and types of peripheral equipment, technical skills, and compliance issues. Davies et al. proposed a framework for telehealth curricula that includes telehealth delivery, compliance, and privacy domains, which could adequately address these weaknesses. By also ensuring students have ample opportunities to perform telehealth services during clinical experiences; telehealth curricula may most effectively improve student knowledge and attitudes regarding telehealth.

Limitations

Several limitations should be considered regarding methodology and the ability to draw conclusions from the gathered data. First, the study was a quantitative and descriptive design in nature, which required participants to assess knowledge and attitudes before and after telehealth curricula. This type of design may allow for positivity bias due to the retrospective nature of the survey questions. Additionally, the small sample size due to a low participation rate may limit generalizability.

Conclusions cannot be made regarding cause and effect using a descriptive design. Thus, we cannot conclude that telehealth curricula was the true cause of improved knowledge and attitudes regarding telehealth. Nevertheless, recent physical therapy graduates felt more knowledgeable and had more positive attitudes regarding telehealth at the conclusion of telehealth curricula.

Recommendations for Future Research

Recent research has begun to examine important domains related to effective telehealth practice in physical therapy.

Using these established domains, Davies et al. proposed a framework for the inclusion of these important domains in telehealth curricula in physical therapy education. Future research must examine the effectiveness of these proposed domains as they are applied to telehealth curricula design and delivery.

Conclusion

Exploration of graduate telehealth curricula and how it prepares physical therapists to deliver telehealth services could better guide graduate curricula. Telehealth curricula is currently poorly employed in graduate physical therapy education. Despite its poor utilization, telehealth curricula do improve knowledge and attitudes regarding telehealth. By improving physical therapist knowledge and attitudes, telehealth curricula may better prepare physical therapists to deliver telehealth services. Additional research should be performed to examine which domains of telehealth curricula must be improved. The results of this study demonstrate telehealth curricula can be effective at improving knowledge as well as attitudes and should be implemented in graduate physical therapy curricula.

References

1. Miller MJ, Pak SS, Keller DR, et al. Evaluation of pragmatic telehealth physical therapy implementation during the COVID-19 pandemic. *Phys Ther.* 2021;101(1):pzaa193.
2. Randall K, Steinheider B, Isaacson M, et al. Measuring knowledge, acceptance, and perceptions of telehealth in an interprofessional curriculum for student nurse practitioners, occupational therapists, and physical therapists. *J Interactive Learning Res.* 2016;27(4):339-53.
3. Wentink MM, Siemonsma PC, van Bodegom-Vos L, et al. Teachers' and students' perceptions on barriers and facilitators for eHealth education in the curriculum of functional exercise and physical therapy: a focus groups study. *BMC Med Educ.* 2019;19(1):1-8.
4. Awadallah M, Janssen F, Körber B, et al. Telemedicine in general neurology: interrater reliability of clinical neurological examination via audio-visual telemedicine. *Eur Neurol.* 2018;80(5-6):289-94. 4
5. Kirkland EB, DuBose-Morris R, Duckett A. Telehealth for the internal medicine resident: a 3-year longitudinal curriculum. *Journal of Telemedicine and Telecare.* 2021;27(9):599-605.
6. Ha E, Zwicky K, Yu G, et al. Developing a telemedicine curriculum for a family medicine residency. *PRiMER.* 2020;4:21.
7. Jonas CE, Durning SJ, Zebrowski C, et al. An interdisciplinary, multi-institution telehealth course for third-year medical students. *Acad Med.* 2019;94(6):833-7.
8. Brockes C, Grischott T, Dutkiewicz M, et al. Evaluation of the education "Clinical Telemedicine/e-Health" in the curriculum of medical students at the University of Zurich. *Telemed J E Health.* 2017;23(11):899-904.

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9. Walker C, Echternacht H, Brophy PD. Model for medical student introductory telemedicine education. *Telemed J E Health*. 2019;25(8):717-23.
10. Azma K, RezaSoltani Z, Rezaeimoghaddam F, et al. Efficacy of tele-rehabilitation compared with office-based physical therapy in patients with knee osteoarthritis: A randomized clinical trial. *J Telemed Telecare*. 2018;24(8):560-5.
11. Richardson BR, Truter P, Blumke R, et al. Physiotherapy assessment and diagnosis of musculoskeletal disorders of the knee via telerehabilitation. *J Telemed Telecare*. 2017;23(1):88-95.
12. Mbada CE, Olaoye MI, Dada OO, et al. Comparative efficacy of clinic-based and telerehabilitation application of Mckenzie therapy in chronic low-back pain. *Int J Telerehabil*. 2019;11(1):41.
13. Peterson S, Kuntz C, Roush J. Use of a modified treatment-based classification system for subgrouping patients with low back pain: Agreement between telerehabilitation and face-to-face assessments. *Physiother Theory Pract*. 2019;35(11):1078-86.
14. Bini SA, Mahajan J. Clinical outcomes of remote asynchronous telerehabilitation are equivalent to traditional therapy following total knee arthroplasty: a randomized control study. *J Telemed Telecare*. 2017;23(2):239-47.
15. Cramer SC, Dodakian L, Le V, et al. Efficacy of home-based telerehabilitation vs in-clinic therapy for adults after stroke: a randomized clinical trial. *JAMA Neurol*. 2019;76(9):1079-87.
16. Levy CE, Geiss M, David Omura DPT MH. Effects of physical therapy delivery via home video telerehabilitation on functional and health-related quality of life outcomes. *J Rehabil Res Dev*. 2015;52(3):361.
17. Campbell DF, Brismee JM, Allen B, Hooper TL, Domenech TA, Manella K. Clinical Reasoning Readiness and Confidence of DPT Students with PT Interventions Using Telehealth. 2022. 17
18. Davies L, Hinman RS, Russell T, et al. Self-reported confidence of final year Australian physiotherapy entry-to-practice students and recent graduates in their capability to deliver care via videoconferencing. *Eur J Physiother*. 2022:1-6.
19. Worek A, Sabo KK, Eddy EZ, et al. Students Tele-All: Self-Efficacy and Self-Reflection as Measures of Student Success in Telepractice Training. *Education Sci*. 2022;12(5):302.
20. Martin R, Mandrusiak A, Russell T, et al. New-graduate physiotherapists' training needs and readiness for telehealth. *Physiother Theory Pract*. 2022;38(13):2788-97.
21. Davies L, Hinman RS, Russell T, et al. An international core capability framework for physiotherapists to deliver quality care via videoconferencing: a Delphi study. *J Physiother*. 2021;67(4):291-7.