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Patient-centeredness and acceptability of remotely delivered physical therapy care for musculoskeletal disorders in four large hospitals within the Military Health System

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Abstract

Background Physical therapy services delivered remotely are becoming more common. The purpose was to summarize the acceptability and patient-centeredness of remotely delivered physical therapy.

Methods This was a survey study. Patients and clinicians from physical therapy clinics in the US Military Health System were asked to provide feedback at the conclusion of each remote visit. Platform, reason for care, components of physical therapy delivered and received, satisfaction, and perception of patient-centeredness were collected. Results were summarized as proportions and frequencies.

Results Feedback was provided by physical therapists for 250 visits and from patients for 61 visits. Most visits were completed using audio only ($n = 172$; 68.8%) while the rest integrated video capability ($n = 78$; 31.2%). Overall patients perceived their care was patient-centered either completely or very much. Over 90% of visits were perceived by physical therapists as being highly patient centered. For 53.2% of visits, patients thought that same visit would have been even more impactful in person and for 52.4% of visits, physical therapists thought the visit would have been more impactful in person.

Conclusion Even though remotely provided physical therapy care was rated by patients to be patient-centered, approximately half of the patients responding felt the same physical therapy visit would have been more impactful in person. Similarly, physical therapists felt that their intervention would have been more impactful in person for approximately half of all visits. Physical therapy care delivered remotely was patient-centered and an acceptable alternative to in-person care for both patients and physical therapists.

Keywords Virtual health, Telehealth, Physical therapy, Musculoskeletal, Ehealth, Feasibility studies, Remote rehabilitation, Telerehabilitation, Virtual rehabilitation, Military medicine

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Background

The market for remote delivery of medical care has been growing over recent years, taking a sharp spike in 2020 due in large part to the COVID-19 pandemic [1–3]. Remote delivery of care saw a substantial increase as health systems struggled to meet clinical care needs at a time when in-person interactions became limited and, in most cases, prohibitive. Remote delivery has the potential to expand the footprint of healthcare markets, to include increased specialized care for many settings with historically reduced access (e.g., remote and/or rural areas). Other settings that require creative care delivery options include members of highly mobile workforces, such as military service members or other government employees where the operational tempo is fast and often occurs in austere environments all around the world. Remote health delivery affords the potential for agile and adaptable care delivery that can meet many different needs defined within these constraints.

One concern about remote delivery of care is that it will be less impactful and can lose its patient-centeredness [4, 5]. Patient-centered care is one of six domains that make up quality healthcare, defined by the Institute of Medicine as “care that is respectful of, and responsive to, individual patient preferences, needs and values, and ensuring that patient values guide all clinical decisions.” [6] Patient-centered care can improve both individual and population health outcomes [7, 8], and is, therefore, an important target for many health systems looking to deliver quality medical care. Whether these goals can be achieved when physical therapy care is delivered remotely is unknown.

Physical therapy is traditionally a very “hands-on” interaction, providing many unique challenges related to feasibility and effectiveness when in a remote format. Physical therapists are an integral part of medical teams that help manage musculoskeletal pain disorders in many settings to include the Military Health System (MHS), in both garrison and deployed environments [9–14]. During the global pandemic of 2020, most physical therapy clinics within the MHS managed current and new patients remotely, removing most in-person care options. Several studies have assessed acceptability and effectiveness of remote or telerehabilitation programs, [15–17] mostly within environments where patients have a choice between remote or in-person care. When both patients and physical therapists do not have a choice in delivery options, acceptability and both patient and clinician perception of value is unknown.

The purpose of this study was 1) to report patient and clinician perception related to patient-centeredness of remote care, 2) patient acceptability to receiving physical therapy remotely, and 3) to characterize the perspectives

of physical therapists delivering this care to determine if they were satisfied with their ability to deliver care effectively.

Methods

Study design

This was a survey-based study with data collected as part of a performance improvement project. The project was deemed exempt from ethics approval by the US Army Regional Health Command Central Institutional Review Board due to use of already collected data that was fully anonymized.

Setting

The survey was disseminated within five Physical Therapy clinics in the MHS (Washington and Texas, USA), with patients from only four of these clinics providing responses. These clinics represent some of the largest hospitals in the Military Health System and were collecting this data as part of a quality improvement project to better understand the needs of their patients. Therefore, this was a sample of convenience.

Recruitment process and eligibility

As patients completed their remote care appointments with a physical therapist, they were asked by the therapists at the end of their session if they were interested in providing feedback about their sessions. Individuals who agreed were sent an email with the link to the survey. Patients were only given the option of a remote visit if they wanted physical therapy services. The only criteria for taking the survey were participation and completion of a remotely delivered physical therapy appointment.

Survey tools

For patients, the questions revolved around two themes, patient-centered care and acceptability of remote physical therapy as an alternative to in-person care. The Revised Patient Perception of Patient-Centeredness (PPPC-R) questionnaire has 18 items, with a range of answers from 1 = completely to 4 = not at all. The PPPC-R provides information within three factors: the healthcare process, context and relationship, and roles. It is a valid measure of patient-centered care as experienced by the patient [18]. Patients were also asked simply if given the choice of settings (remote or in-person) and considering their most recent visit, would they have preferred it to be in-person or have been just as happy with the remote visit as an alternative to in-person care.

For physical therapists, the questions revolved around the specific interventions used or delivered in the encounter and their perceptions surrounding the effectiveness of the remote delivery. Physical therapists were

asked to provide feedback after encounters with patients, preferably immediately after the encounter to minimize recall bias. This feedback was collected through a 7-item survey, adapted from the Telehealth Usability Questionnaire [19], including an additional question related to perceived ability to meet the patient's needs [7], in order to make it relevant for clinicians and address acceptability and patient-centered components of care. Answers ranged from 1 = completely disagree to 5 = completely agree.

The surveys were provided via an electronic link so that participants could answer the questions remotely and anonymously. The survey answers for the patient were paired to the survey answers for the therapist via a link code if both were filled one out for the same visit.

Analysis plan

For all the feedback, descriptive statistics were calculated, showing the proportion of patient and clinician beliefs around each of the survey questions, grouped within relevant themes. With paired responses, we assessed agreement between physical therapists and patients on whether they thought the visit would have been better in person. We also conducted a series of exploratory analyses to assess relationships between visit characteristics (initial evaluation or follow-up visit, audio-only versus video visits), and perceptions about whether the virtual visit would have been more impactful in person. Finally, the free text in response to the prompt to further expand on why the session would have been better in person rather than remote (if the clinician stated it would have been more impactful in person) were collected and aggregated into themes based on the nature of the comment. The initial theme categories were developed jointly by two individuals on the research team and then shared with the rest of the investigators, who include in clinical and clinical leadership roles. Modifications were made until all investigators were satisfied with the the final categories.

Results

Four larger military treatment facilities within the MHS asked for feedback from patients and clinicians regarding their experience with remotely delivered physical therapy. Feedback was provided from physical therapists for 250 visits and by patients for 61 visits (Table 1). There was a total of 67 physical therapists available to see patients across all these clinics during this period; however, not every therapist had a patient fill out a survey and some therapists had multiple patients fill out surveys. Most visits were delivered via audio only ($n=172$; 68.8%) and the rest with additional video capability ($n=78$; 31.2%) using various platforms (Fig. 1). The type of visit was split

Table 1 Summary of descriptors and demographics of remote physical therapy visits

Mean Age (SD) [Range]	35.33 (10.14) [21 to 61]
Proportion of Male/Female Patients	Male $N=40$ Female $N=21$
Body Region of Patient Chief Complaint	Stomach ($N=1$) Foot ($N=1$) Ankle ($N=6$) Knee ($N=11$) Hip ($N=8$) Back ($N=17$) Shoulder ($N=12$) Not Specified ($N=4$)

almost evenly between initial evaluations (46.8%) and follow-up visits (53.2%). Treatment components delivered by physical therapists and received by patients are reported in the supplementary appendix (SA 1 and SA2).

Patient feedback

There were 61 patient responses, with most visits conducted over the phone (87.1%), compared to computers (6.5%), tablets (4.8%), and other devices (1.6%). The three most common reasons for seeing a physical therapist were back, shoulder, and knee pain (Table 1). Every single patient replied “completely” or “mostly” to questions about 1) the extent their main problem was discussed, 2) how well the provider understood their problem, 3) satisfaction with the discussion of the problem, 4) their agreement with the clinician's consensus of the problem, 5) the extent their provider considered their thoughts and feelings, 6) the extent the provider respected their beliefs, values and customs, 7) the extent the provider showed them compassion, and 8) the extent the provider really listened to them. The large majority answered the same (“completely or “mostly”) when asked how comfortable they were discussing their personal problems related to their health with their provider (96.9%), and the remaining responses also reflected high patient satisfaction (Fig. 2). Patients asked at the end of the remote visit about having the choice for that visit again remotely or in-person were split, with 33 (53.2%) saying they would prefer the visit in person, while the other 29 (46.8%) stated they would have done the visit remotely again. Overall, most thought it was better than not receiving any physical therapy (see specific patient comments in the [supplementary appendix—SA4](#)).

Clinician feedback

Most clinicians agreed they could easily talk with patients (96.4%), they could clearly understand their patient's needs (94.4%), had the perception that patients were able to fully express themselves and their concerns (92.8%),

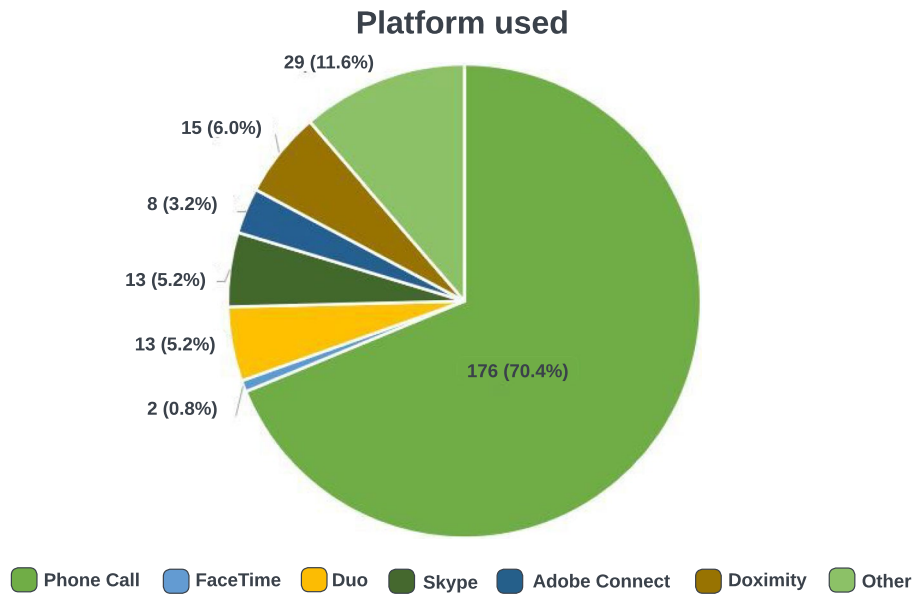
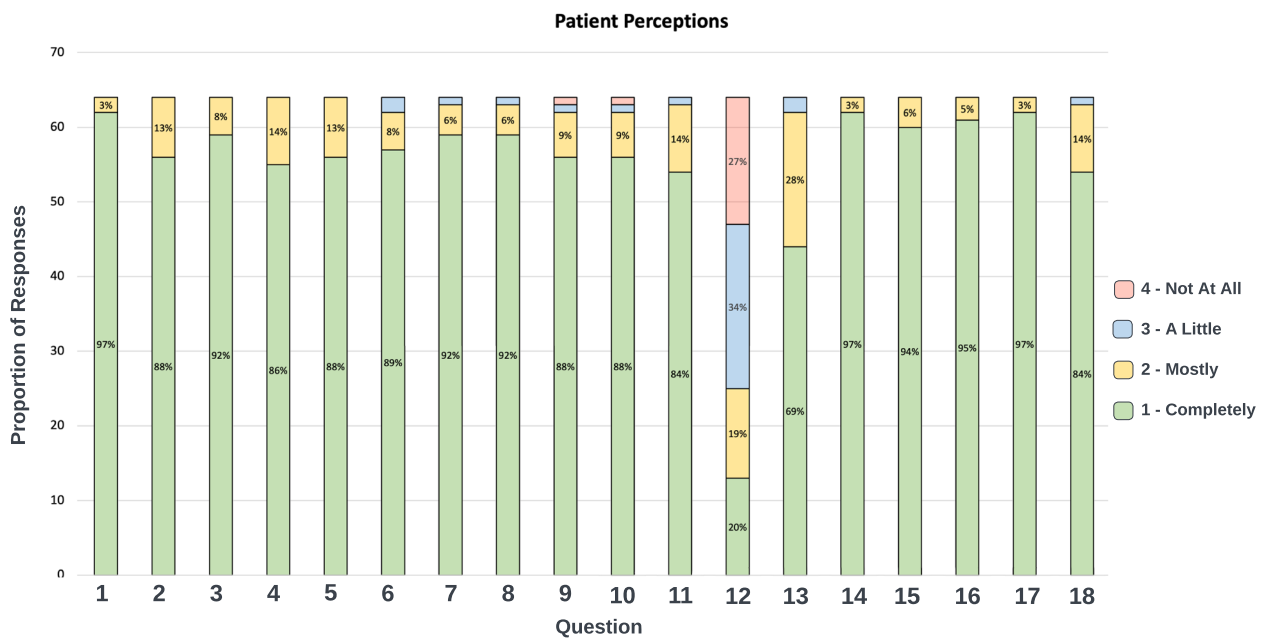


Fig. 1 Platforms used to deliver remote care categorized by proportion



1. To what extent was your main problem(s) discussed today?
2. How well do you think your provider understood you today?
3. How satisfied were you with the discussion of your problem?
4. To what extent did your provider explain this problem to you?
5. To what extent did you agree with your provider's opinion about the problem?
6. To what extent did your provider ask about your goals for treatment?
7. To what extent did your provider explain treatment?
8. To what extent did your provider explore how manageable this treatment would be for you?
9. To what extent did you and your provider discuss your respective roles?
10. To what extent did your provider encourage you to take the role you wanted in your own care?
11. How much would you say that this provider cares about you as a person?
12. To what extent does your provider know about your family life?
13. How comfortable are you discussing your personal problems related to your health with your provider?
14. To what extent does your provider consider your thoughts and feelings?
15. To what extent does your provider respect your beliefs, values and customs?
16. To what extent does your provider show you compassion?
17. To what extent does your provider really listen to you?
18. To what extent do you trust your provider?

Fig. 2 Proportion of patient responses to revised patient perception of patient-centeredness tool

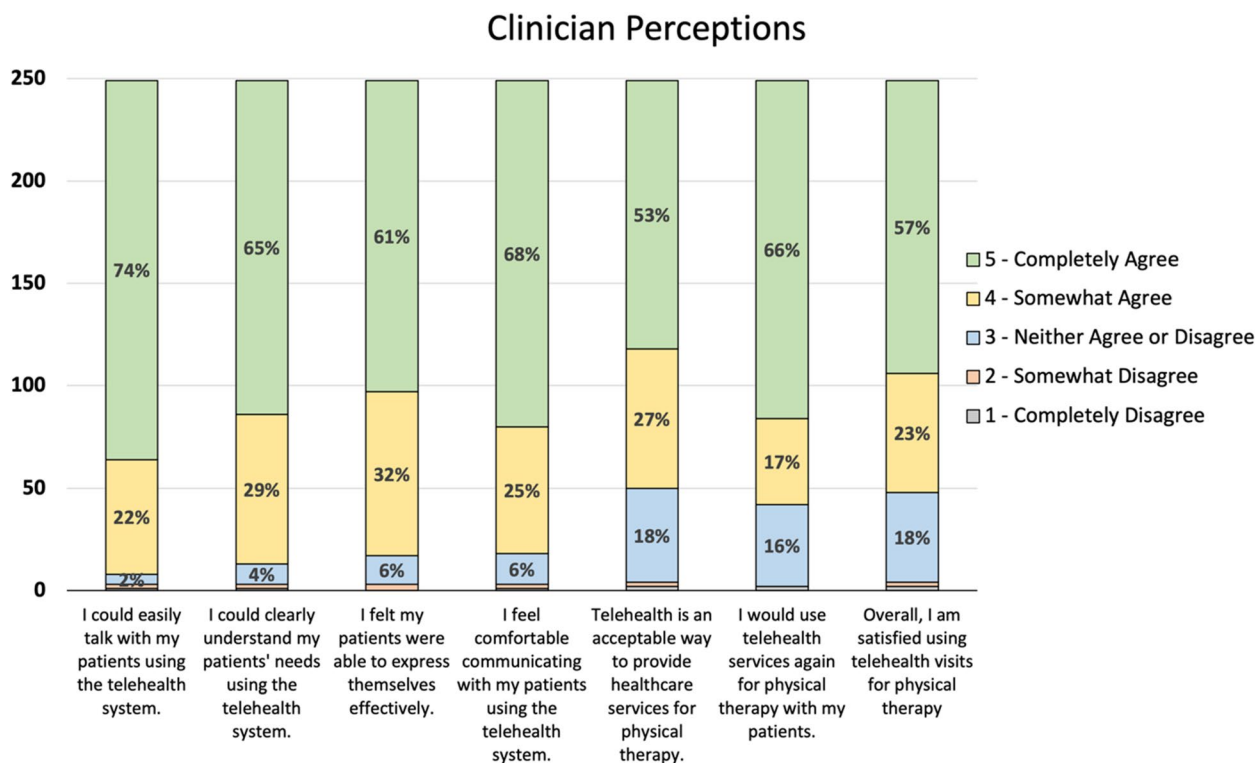


Fig. 3 Perception of patient-centered care delivered by physical therapists

and felt overall comfortable communicating with patients this way (92.4%; Fig. 3). At the end of each patient encounter, clinicians were asked: “For this particular patient and visit, would this encounter have been more impactful in person”? It was split approximately equally, with 113 (52.4%) saying “yes” and 119 (47.6%) saying “no”. When asked what would have made the encounter more impactful in person, seven themes emerged (Fig. 4 and supplementary appendix SA3). Most of these themes revolve around traditional physical therapy practices, such as assessing joint range of motion, provocative tests to assist with ruling in or out a specific disorder, neurological screening, and visual assessment/palpation of the direct and adjacent areas of concern. Related to interventions, cueing patients when performing exercises was more challenging, and other hands-on treatments were not possible even if the physical therapist may have considered it appropriate (e.g., manual therapy, dry needling). Some clinicians provided responses for interactions with more than one patient.

Patient and clinician agreement

There were only 30 visits where the survey answers from the patient and the clinician could be paired. The patients and clinicians each had 14 of these paired visits where if given the choice, they would have rather had the visit

in person. For the other 16 visits, the remote visit was deemed just as appropriate as done in person. These visits were not all the same. There were 14 out of the 30 visits (46.7%) that had agreement between the patient and clinician, where both stated that if given the choice, they would have had that same visit again remotely rather than in person or in person rather than remotely.

Expressed limits of remote delivery

Both patients and clinicians expressed some concerns with completing the appointment remotely. A minority of patients and clinicians (2–3) noted technical issues, making it difficult to understand either the patient or clinician due to poor network connection issues. Additionally, some physical therapists did not feel comfortable with the level at which they were able to screen patients for red flags or other medical conditions that would confirm whether they were appropriate for physical therapy.

Exploratory analyses

Clinician preference of having the same visit again virtually or in person was no different between individuals assessed via audio only compared to audio plus video (OR 0.99; 95%CI 0.58, 1.69). The odds of a clinician preferring that the same visit were conducted in person rather than virtually were much higher if the visit was

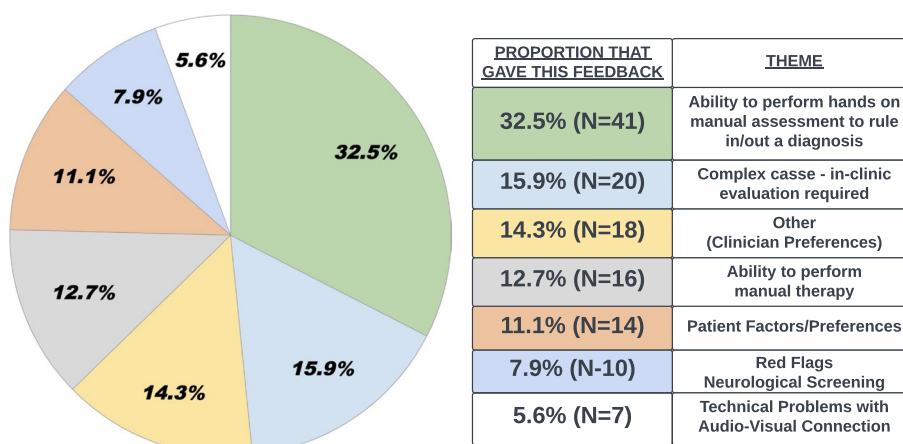


Fig. 4 General themes from clinicians regarding why a telehealth visit would have been more impactful in person

an initial evaluation compared to a follow-up (OR 1.48: 95%CI 1.16, 1.88). The odds that the clinician would perceive remote physical therapy as effective after a visit were not significantly different if the visit was audio only versus video (OR 1.113: 95%CI 0.99, 1.26), but were significantly less likely if the visit was an initial evaluation versus a follow-up visit (OR 0.84: 95%CI 0.74, 0.96). Finally, the odds of being overall satisfied with the virtual visit were significantly higher if the visit was video compared to audio only (OR 1.20: 95%CI 1.07, 1.34), and if the visit was a follow-up rather than an initial evaluation (OR 2.48: 95%CI 1.42, 4.33).

Discussion

Remote delivery of physical therapy services appeared to be acceptable in many cases for both patients and physical therapists when in-person care was not an option. Most patients ranked their visits high for patient-centeredness. All patients felt like their problems were heard and understood by the clinician either “completely” or “very much”. Despite high patient satisfaction and considering remote visits better than no visit at all, for approximately half of all encounters, both patients and clinicians felt that the interaction would have been more impactful if conducted in person. Conversely, half of patients if given the choice would have had their encounter remotely again rather than an in-person visit. These findings suggest that there is likely a subset of patients and/or specific conditions for which remote delivery of physical therapy would be ideal and even preferable. Further investigation is necessary to best determine which types of patients, which types of disorders, and what components of physical therapy should be prioritized for this type of approach [20]. The ability to accurately screen and triage cases that would excel in this environment versus in-person care

would be of great value for health systems looking for efficient use of resources.

Video-based interactions were more likely to be perceived as effective and result in the clinician feeling overall satisfied with the telehealth visit, compared to audio-only interactions. This seems intuitive considering that visualization of information often improves understanding, engaging additional cognitive and emotive stems of thought [21]. Visual connection might also improve the perception of therapeutic alliance between clinician and patient, as visual cues and facial expressions can enhance the communication between the two individuals [22]. The clinician might feel less comfortable making a definitive statement about an appropriate plan of care without visualization, as feedback from the clinicians (supplementary appendix SA.3) would suggest about why they thought the remote visit would have been more impactful in person: inability to “visualize functional movements, palpation” and “would have been much more effective to watch this person move in person”. Clinicians often rely on non-verbal communication to strengthen the quality of their interaction with patients [22, 23], and visualization can enhance how both patients and clinicians think about information they receive [24]. Clinicians in other settings have similarly remarked at the challenges of missing important non-verbal cues when using telehealth visits, even when there are video options, that may not capture visual context to the same detail as occurs in person [22, 25].

Acceptability of remote delivery of physical therapy has been examined previously. During a 2-month period in 2020, 40 physical therapists saw a total of 4548 unique patient visits and 85% of these were performed remotely [26]. Based on a 10-item Likert scale, patients in 94% of visits were satisfied with their care and 92% indicated

they would be willing to attend another physical therapy session remotely. Remote care delivery appears to be optional in this cohort, for both patients and clinicians, although 100% of physical therapists opted to adopt remote delivery for at least one patient [26]. Satisfaction and clinical outcomes with telehealth physical therapy appear to be the same in skilled nursing facilities [27], and for remote physical therapy care for specific conditions, such as knee osteoarthritis [28, 29]. In another survey of physical therapists delivering care remotely in Australia, 83–89% had moderate or extremely positive perceptions about its effectiveness, and 47% of patients involved in one-on-one care were moderate or extremely positive about choosing remote physical therapy options in the future [30]. None of the studies assessed the extent that remote care was patient-centered or the perception of the effectiveness of care from both the patient and the physical therapist perspective, on a case-by-case basis. We feel this is an important variable to measure, as decisions related to the implementation of remote delivery of physical therapy care are not likely to be an all-or-none scenario.

Other settings have established that remote care can be patient-centered, and include care around liver transplant [31], interdisciplinary geriatric care [32], and at-home dialysis [33]. However, these settings do not usually involve as much “hands on” care as is expected from traditional physical therapy delivery. Most reviews on the topic agree that patient-centered care is an important tenet of remote care delivery [34, 35]. The findings from our study are noteworthy as they highlight that physical therapy delivered remotely can be highly patient-centered.

Understanding the value of remote delivery of physical therapy services requires additional perspective. Value and preference must be considered contextually and on a by-case basis. While half of the individuals and clinicians thought their visit would have been more impactful in person, perhaps the more **clinically** relevant question revolves around whether the remote visit was better than no visit at all. In other words, when in-person care is not possible, does a remote visit provide enough benefit to be justified over no visit at all? We feel that this is an important consideration with all future investigations into the effectiveness of remote delivery of physical therapy interventions. With remote care delivery options expected to grow even more, and as advances in technology continue to expand capabilities, ongoing research is necessary to ensure that care remains effective, efficient, and patient-centered.

Our results suggest that patients and clinicians don't always agree on whether in-person care could have been better than delivered remotely. In only 14 out of 30 paired

cases (<50%) did both the clinician and patient agree that either the visit would have been better in person or that it would not have been better in person, being just as effectively delivered remotely. Optimal ways that show potential for improving patient-centeredness based on feedback from these surveys include using video over audio-only options, attempting to reserve remote care interactions for follow-up visits only, if possible, after having the initial evaluation in person, and improving the ability to make additional assessments remotely (e.g., gait and movement analysis, objective functional performance). Emerging technologies with sensors, biofeedback, and the ability for remote monitoring and asynchronous interactions with the clinician [36, 37], have the potential to improve the quality of information available to clinicians in this setting. This in turn can likely increase certainty and improve assurance provided to patients, which can lead to greater therapeutic alliance. Future technologies also promise to improve the interpretation of non-verbal communication using artificial intelligence [38].

Limitations

This study represented a relatively small sample of both patients and clinicians in the MHS. The experiences and feedback at these clinics may not be generalizable to those in other clinics or settings, even others within the MHS. The feedback represents perceptions after a single visit, rather than after their entire episode of care in physical therapy; perceptions about effectiveness could change over this period of time. Further, these results reflect the perspectives of patients that agreed to receive physical therapy in a remote manner. Other patients, when given the choice between remote PT or no PT, may have chosen the latter and had different opinions. As this survey was not mandatory, we cannot rule out the possibility of volunteer bias. Finally, most of the analyses were exploratory in nature, not designed prospectively, and therefore were likely underpowered to properly answer the question. These results should be interpreted with caution.

Conclusion

Physical therapy care delivered remotely for patients with musculoskeletal disorders was considered patient-centered, and an acceptable alternative to in-person care for both patients and physical therapists. Even though remotely delivered physical therapy care was considered by patients to be patient-centered, for approximately half of the visits (53.2%), patients felt their physical therapy visit would have been more impactful in person. Similarly, the physical therapists felt that in 52.4% of visits,

their care would have been more impactful in person than what they were able to provide remotely.

Supplementary Information

The online version contains supplementary material available at <https://doi.org/10.1186/s44247-023-00017-0>.

Additional file 1.

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Disclaimer

The view(s) expressed herein are those of the author(s) and do not reflect the official policy or position of the Defense Health Agency, the U.S. Army Office of the Surgeon General, the Department of the Army, the Department of the Air Force, the Department of Defense, or the U.S. Government.

Authors' contributions

DR, DA, LK, BP and ES conceptualized the study and provided oversight for data collection. RM, MC, and TA helped consolidate and organize data for and conduct preliminary analysis. DR analyzed the data. All authors were involved in interpretation of the data, initial draft of manuscript and approval of final manuscript.

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Availability of data and materials

The datasets used and/or analyzed during the current study are available from the corresponding author on reasonable request. Raw data generated from the survey free text sections is available in the [supplementary appendix](#).

Declarations

Ethics approval and consent to participate

The project was deemed exempt from ethics approval by the US Army Regional Health Command Central Institutional Review Board due to use of already collected data that was fully anonymized. All research was performed in accordance with the Declaration of Helsinki.

Consent for publication

N/A.

Competing interests

The authors declare no competing interests.

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