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VALIDITY AND REPRODUCIBILITY OF METHODS AND VARIABLES TELEREHABILITATION INSTRUMENTS FOR STATIC POSTURAL ASSESSMENT: A SCOPING REVIEW

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ABSTRACT

The objective of this scoping review was to identify, examine and describe the instruments used to assess static body posture through telerehabilitation, whose measurement properties are described. Due to the pandemic, it has become common to carry out postural assessments remotely, as a different approach to face-to-face assessments has become necessary. The review was performed according to the steps recommended by the Joanna Briggs Institute (JBI) and the PRISMA-ScR method for scoping review. The Pubmed, Embase and Scopus databases were searched during March and April 2022. Studies could be published in English, Spanish or Portuguese, and there was no deadline for the chosen studies. Only three studies were found that performed static postural assessments remotely and described their measurement properties. The main limitations reported were technical issues, use of a simulated environment and the tendency of people evaluated to be ashamed to undress. The results of this review suggest that there is limited evidence to help physical therapists perform static posture assessments remotely. More research is needed to determine the validity and reproducibility of postural assessment methods by telerehabilitation.

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INTRODUCTION

Methods to assess an individual's posture have been used for decades in different situations, including schools, clinics, and gyms, as they can be used to prescribe exercises or treatments and as a reference for future intervention (FURLANETTO, CHAISE, CANDOTTI, LOSS, 2011). As a result of the COVID-19 pandemic (the disease caused by the novel coronavirus-SARS-CoV-2) and the new global environment, available therapeutic resources have developed rapidly along with increased use of remote consultations, monitoring, and virtual activities (McINTYRE, ROBINSON, MAYO, 2020). According to Prvu and Resnink (2020) **t**elerehabilitation **"**refers specifically to clinical rehabilitation services with a focus on assessment, diagnosis and treatment". Telerehabilitation can be provided in a variety of ways, including real-time visits with audio, video or both; and asynchronous visits; virtual entry records; remote assessments of recorded videos or images; and telephone assessment and management services (PRUV, RESNINK, 2020). In this context, telerehabilitation has become more necessary, as it is a tool that can be used strategically to overcome physical and geographical obstacles. This expansion highlights the need to develop technical tools, both to provide remote assistance (McINTYRE, ROBINSON, MAYO, 2020) and to help diagnose conditions remotely (MANI, SHARMA, SINGH, 2021). In terms of postural assessment, these new circumstances resulted in its being conducted via telemedicine. This new situation applies throughout the clinical area, whether clinical or physical therapy assessments, (MANI, SHARMA, OMAR, PAUNGMALI, JOSEPH, 2017) and also in academia, where research and extension projects related to postural assessment (RIBEIRO et al, 2020) have begun to accept this new approach and adapt their information collection methods. The central issue with which these new methods contend is the reproducibility of their results. One of the main challenges, therefore, in the implementation of remote physiotherapy is being able to carry out physiotherapy assessments with validity and reproducibility (MANI, SHARMA, SINGH, 2021). This means that it is important to develop a research approach that can establish the validity of remote assessments based on evidence that measurements made through remote assistance correspond to those performed by traditional face-to-face care (STEELE, LADE, McKENZIE, RUSSELL, 2012). Assessments are vital when it comes to making treatment decisions, so measurement properties for remote methods of postural assessment need to be established before these methods are used in practice. Thus, validity and reproducibility are important characteristics that must be considered when choosing or developing tools, whether in clinical practice, schools, or research (MANI, SHARMA, OMAR, PAUNGMALI, JOSEPH, 2017). The lack of consensus in the literature relative to taxonomy, terminology, and definitions has led to confusion about what measurement properties are relevant and what concepts they actually represent. The taxonomy of measurement

properties presents extremely relevant measures when evaluating the quality of an instrument (SOUZA, ALEXANDRE, GUIRARDELLO, 2017). For this scoping review, using the study by Mokkink et al. (2016) and based on a consensus among psychometricians, epidemiologists, biostatisticians, and clinicians, we established a taxonomy of measurement properties relevant to health measurement instruments. In terms of measurement properties, concurrent validity is understood as the agreement between measurements taken simultaneously for the target test and the gold standard (GADOTTI, VIEIRA, MAGEE. 2006). Reproducibility is the agreement between measurements taken using the same tool under different conditions, such as time and evaluator (FURLANETTO, CHAISE, CANDOTTI, LOSS, 2011).

To carry out this work, we chose the scoping review as a research method, which, according to Tricco et al. (2018) is an approach increasingly used for a type of knowledge synthesis that gathers evidence in a broad way and identifies the main features and gaps. They must be carried out with a high degree of rigor and must follow exactly the guidelines of the most up-to-date methodological guides to provide updated information and thus guarantee the accuracy of the reported data (PETERS et al, 2020). This scoping review is relevant because it investigates what instruments, the measurement properties of which have been evaluated, are available to assess static posture through telerehabilitation, and it seeks to promote information and discussion about the existing research. It should be noted that the importance of researching measurement properties and the rigor used to evaluate them are the basis for determining the choice of a reliable instrument that supports clinical and therapeutic decision-making, especially based on evidence-based health practice. Although other studies have sought to identify how the assessment of static posture has been carried out through remote assistance, we did not find any study that contemplated the review that we undertook. To the best of our knowledge, this is the first review to evaluate the measurement properties of tools currently in clinical use. Based on these premises, this scoping review aimed to identify, examine, and describe the tools, methods, and variables used to assess static body posture by telerehabilitation and describe its measurement properties. Second, the study aimed to identify what anatomical planes and body parts were evaluated, what psychometric parameters were investigated, and what were their results. We also sought to identify the main limitations related to carrying out remote postural assessments.

METHODS

This study is a scoping review based on the JBI (Joanna Briggs Institute) (PETERS et al. 2020) methodological guide and on the guidelines for reporting studies of the PRISMA-ScR (PRISMA Scoping Review) (TRICCO et al, 2018). The protocol was registered in the Open Science Framework https://archive.org/details/osf-registrations-ju85e-v1. Osf_doi:10.17605/OSF.IO/JU85E. This review included studies that used means of assessing posture other than those performed in person, without restrictions regarding age or sex. Studies published in English, Spanish, or Portuguese were considered. We imposed no limitations with regard to time frame for the selected studies.We selected in vivo studies of populations without a specific clinical condition and without age or sex restrictions. We established that the concept was composed of instruments that assess static body posture, the measurement properties of which had been described and evaluated. The context for this review was telerehabilitation, in which all assessments were considered as long as they were not carried out in person.The databases were searched during the months of March and April 2022, and the search strategy for this review took place in three stages. In the first stage, a search was carried out in the Pubmed (Appendix I), Scopus and Embase databases. For the Pubmed search, the following MeSH terms and their descriptors were used: “physical examination,” “posture,” “reproducibility of results,” “telerehabilitation,” “telemedicine” and “remote consultation” joined with the Boolean operators OR and AND. The search in the other databases (Embase and Scopus) was carried out with the corresponding descriptors, with modifications for acceptance by the indexers. The search for gray literature included the Digital Library of Theses and Dissertations from CAPES and Lume (Digital Repository of the Federal University of Rio Grande do Sul), as well as searches in the reference lists of selected studies to identify additional results. In the second stage, the studies found were imported to the Rayyan platform 19 where they were shared among the reviewers with double blinding. Duplicates were identified, quantified, recorded and excluded. Afterward, all the titles and abstracts of the identified records were read and analyzed for their relevance to the objectives of the study, following the eligibility criteria. In the third step, the eligible texts were read in full to confirm their relevance and extract the data of interest by two blinded and independent reviewers, using an extraction form specifically designed for this research. Data extracted from this form included: (a) identification of studies by authors and year of publication; (b) the characteristics of postural assessments, such as instruments used, whether an instruction manual was made available, the positioning of the person being evaluated, segments evaluated and technologies used; (c) the postural variables included in the studies, as well as the measurement properties and their results; and (d) the limitations found for carrying out the postural assessment through remote care. The extracted data referring to concurrent validity were means and standard deviation (SD), percentage of agreement (%C), confidence interval (CI), Kappa (K), limits of agreement, standard error of measurement (SEM), coefficient of variation (CV), minimum detectable change (MDC) and Chi -square. As for reproducibility, the following data were extracted: interclass correlation coefficient (ICC), confidence interval (CI), standard error of measurement (SEM), coefficient of variation (CV), minimum detectable change (MDC), Kappa (K) and percent agreement (%C). If there were discrepancies, these would be resolved through discussion between the researchers and, if necessary, by a third reviewer.

RESULTS

A total of 794 articles were identified from searches in Pubmed, Embase and Scopus databases, as shown in the flowchart (Figure 1). After removing the duplicates, 758 articles remained based on their titles and abstracts. The full texts of 19 articles were read, following the eligibility criteria. Of these, 16 were excluded because they did not involve evaluations by remote assistance, did not evaluate posture, or did not evaluate the measurement properties; one article was excluded because it came from a systematic review and was already included in the others (Figure 1). Thus, three articles (MANI, SHARMA, SINGH, 2021; TRUTER, RUSSEL, FARY, 2014; NITZKIN, ZHU, MARIER, 1997) composed this scoping review (Figure 1 and Appendix II). No articles were found from the searches carried out in the gray literature, the Digital Library of Theses and Dissertations of CAPES and Lume (Digital Repository of the Federal University of Rio Grande do Sul, Brazil).

The information extracted from the three selected articles is in Appendix II, where the characteristics of the studies and an overview of the instruments are presented, demonstrating which instruments have been used to carry out postural assessment through telerehabilitation, aiming to fulfill the objectives of this scoping review. The publication dates of the three articles were 1997 (NITZKIN, ZHU, MARIER, 1997), 2014 (TRUTER, RUSSEL, FARY, 2014) and 2021 (MANI, SHARMA, SINGH, 2021) a difference of 24 years between the oldest and the most recent study. Two more recent studies used applications to perform posture assessment remotely, (MANI, SHARMA, SINGH, 2021; TRUTER, RUSSEL, FARY, 2014) and one study used a camera and video (NITZKIN, ZHU, MARIER, 1997). In all three studies, the help of an assistant was requested during the evaluation, and none of them mentioned the use of an instruction manual. The two planes, frontal and sagittal, were evaluated in two articles (TRUTER, RUSSEL, FARY, 2014; MANI, SHARMA, SINGH, 2021). The segments evaluated in the frontal plane were postural symmetry, pelvic tilt and asymmetry of the spine.

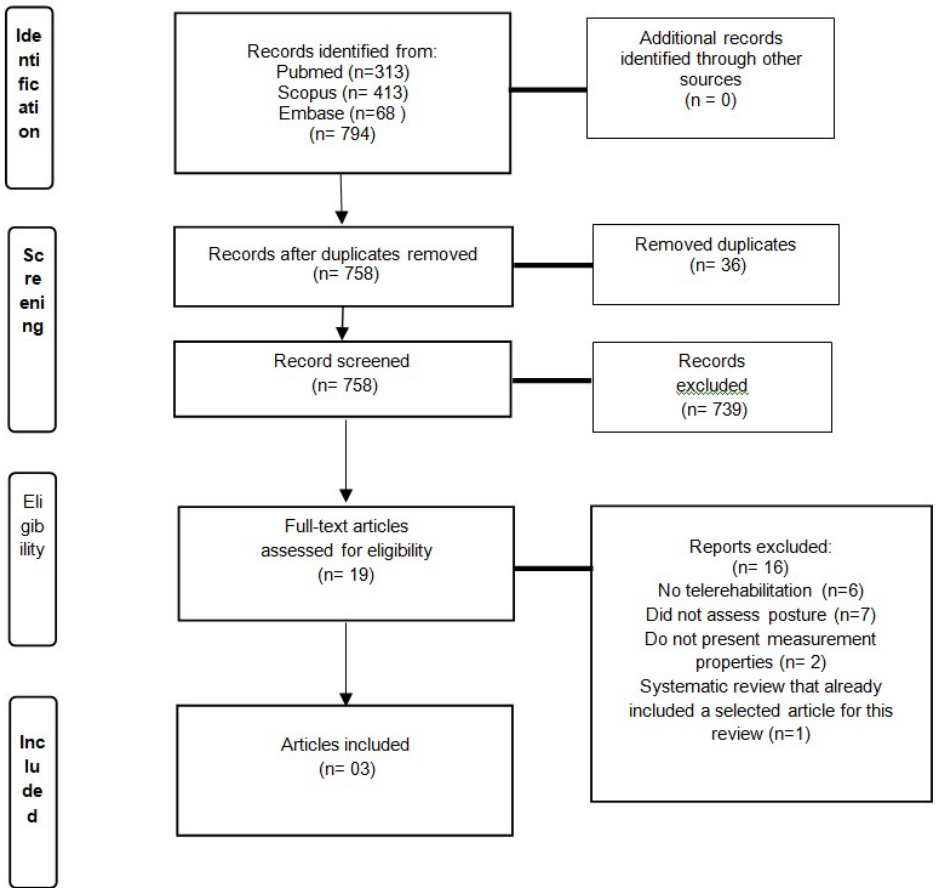

Figure 1. Search results and study selection and inclusion process adapted from PRISMA[18]

Appendix 1. Search strategy on PubMed database

Search	Query	Records retrieved
#1	Posture [MeSH] OR posture OR postures OR "physical examination" [MeSH] OR "physical examination" OR "physical assessment" OR "Examinations, Physical" OR "Physical Examinations" OR "Physical Exam" OR "Exam, Physical" OR "Exams, Physical" OR "Physical Exams" OR "Examination, Physical" OR "Physical Examinations and Diagnoses"	1.472.074
#2	"Reproducibility of Results" [MeSH] OR "Reproducibility of Results" OR "Reproducibility of Findings" OR "Reproducibility Of Result" OR "Of Result, Reproducibility" OR "Of Results, Reproducibility" OR "Result, Reproducibility Of" OR "Results, Reproducibility Of" OR "Reproducibility of Finding" OR "Finding Reproducibility" OR "Reliability of Results" OR "Reliability of Result" OR "Result Reliability" OR "Reliability (Epidemiology)" OR "Validity (Epidemiology)" OR "Validity of Results" OR "Validity of Result" OR "Result Validity" OR "Face Validity" OR "Validity, Face" OR "Reliability and Validity" OR "Validity and Reliability" OR "Test-Retest Reliability" OR "Reliabilities, Test-Retest" OR "Reliability, Test-Retest" OR "Test Retest Reliability"	460.791
#3	Telerehabilitation [MeSH] OR telerehabilitation OR Telerehabilitations OR "Tele-rehabilitation" OR "Tele rehabilitation" OR "Remote Rehabilitation" OR "Rehabilitation, Remote" OR "Virtual Rehabilitation" OR "Rehabilitation, Virtual" OR "Virtual Rehabilitations" OR "tele-rehabilitation" OR "teleassessment" OR "Telemedicine" OR "remote rehabilitation assistance" OR Telemedicine [MeSH] OR Telemedicine OR "Mobile Health" OR "Health, Mobile" OR mHealth OR Telehealth OR eHealth OR "Remote Consultation" [MeSH] OR "Remote Consultation" OR "Consultation, Remote" OR Teleconsultation OR Teleconsultations	68.661
#4	#1 AND #2 AND #3	313
Studies published in English, Spanish or Portuguese were considered and we did not impose limitations on the time frame for the selected studies.		

The sagittal plane evaluated pelvic tilt, pelvic position and lumbar lordosis. In the article by Mani, Sharma, Sing, (2021) only the sagittal plane was examined for evaluation of the cervical spine. Mani, Sharma, Sing (2021) evaluated the concurrent validity, comparing the face-to-face assessment (gold standard) with the remote assessment for the following variables: (a) angleof sagittal head inclination (SHA); (b) craniocervical angle (CCA); (c) shoulder angle (SA). From these results, the authors concluded that the postural assessment of the cervical spine and shoulders performed remotely can be considered valid. Truter, Russel, Fary (2014) also evaluated the concurrent validity of remote assessment compared to face-to-face assessment. Kappa results were below the clinically acceptable threshold for pelvic tilt and spine asymmetry in the coronal plane and for pelvic tilt, lumbar lordosis and thoracic kyphosisin the sagittal plane. p-values for symmetry (p=0.51) and the presence of scoliosis (p=0.14) did not present significant values of agreement.

The authors did not recommend performing a remote assessment of these postural variables. Nitzkin, Zhu, Marier (1997) found that the percentage of agreement between the remote assessment in relation to the gold standard for knee assessment was 80.8%, 90.3% for the cervical region and 95% for the back. The percentage of agreement between the remote assessment and the face-to-face assessment for the knees and cervical spine showed moderate Kappa values. The lumbar spine presented a Kappa ofstrong agreement. The authors concluded that the results of remote and face-to-face assessment are similar and recommend the use of remote assessment when the evaluator is experienced. Regarding the measure of reproducibility, Mani, Sharma and Sing, (2021) found high ICC values, for both intra- and inter-rater reproducibility, for the variables SHA, CCA and AS. The values related to these results and the main limitations are shown in Appendix II.

Appendix II: Characteristics of included studies

Author/Year	Technology used Assessment instrument	Manual and/or guidance	Planes	Positioning of the Participant	Assessed Postural Variables	Reproducibility of Results		Outcome measures	Limitations
						Concurrent Validity	Reliability		
Mani, Sharma, Sing 2021	App telePTsys Photogrammetry	There is no reference to a manual. The TR assessor gave real-time guidance to the caregiver when tests were carried out via the videoconferencing links.	Sagittal	The client's caregiver or clinical assistant was trained to identify the anatomical reference points such as canthus of the eye, tragus of the ear, chin, supracondylar fossa and acromion process, using high-resolution images. They were assisted in placing-coloured adhesive markers for posture assessment.	**SHA**: sagittal head tilt angle **CCA**: craniocervical angle **SA**: shoulder angle	**SHA**: Mean difference: -0.96°; SD: 0.68°; 95% CI: -1.45°, -0.47°; MDC: 1,1; Limits of agreement: -2.15, 0.09 **CCA**: Mean difference: -0.88°; SD: 0.85°; 95% CI: -1.49°, -0.27°; MDC: 1,16; Limits of agreement: -2.47, 0.83 **AS**: Mean difference: -0.32°; SD: 0.79°; 95% CI: -0.89°, -0.25°; MDC: 0,9; Limits of agreement: -1.80, 0.98	Inter-rater **SHA**: ICC: 0.97; 95% CI: 0.89, 0.99°; SEM: 1.04; CV:7.9%; MDC: 2.90° **CCA**: ICC: 0.93; 95% CI: 0.70, 0.98; SEM: 3.41; CV: 8.4%; MDC: 9.45° **AS**: ICC: 0.99; 95% CI: 0.97, 0.99; SEM: 1.57; CV: 4.6%; MDC: 4.36° Intra-rater **SHA**: ICC: 0.96; 95% CI: 0.83, 0.99; SEM: 1.29; CV: 9.0%; MDC: 3.59° **CCA**: ICC: 0.93; 95% CI: 0.69, 0.98; SEM: 3.48; CV: 8.1%; MDC: 9.65° **AS**: ICC: 1.00; 95% CI: 0.98, 0.99; SEM: 1.11; CV: 5.0%; MDC: 3.09°	TR-based physiotherapy assessment of cervical spine is a validity and reliable tool for measuring sagittal neck posture (SHA, CCA and AS)	1. Simulated environment. 2. technical difficulties, such as voice disconnection and a few episodes of freezing of live video streaming. 3. Female clients were unwilling to expose their neck area for assessment via TR due to cultural norms.
Truter, Russel, Fary2014	eHAB® TR system35 Posture was recorded by still images (640 · 480 pixels) using features of the eHAB® TR) system	There is no reference to a manual. Guidance was provided during the assessment	Coronal and sagittal	The TR assessment was performed in a controlled environment, with the participant standing on a reference line on the floor of the clinic and next to a 300-mm black and white calibration index. The participant moved relative to the TR unit under the PT's instruction to provide the appropriate views to the camera on the unit.	Coronal plane assessment the PT identified the presence of postural symmetry, scoliosis, pelvic tilt and spinal rotation. In the sagittal plane assessment, the PT categorically rated lumbar lordosis, thoracic kyphosis, pelvic tilt, and the relative positions of the shoulders, pelvis, and lower limbs.	Coronal: Postural symmetry: %C: 56%; $\chi 2$ (p): 0.43 (0.51) Scoliosis %C: 72%; $\chi 2$ (p): 2.21(0.14) Pelvic tilt (right and left): %C: 52%; K 0.17 Column asymmetry: %C: 36%; K: 0.07 Sagittal: Pelvic tilt: %C: 75%; K: 0.10 Pelvis position (anterior-posterior): %C: 71% Lumbar lordosis: %C: 25%; K: -0.20 Thoracic kyphosis: %C: 50%; K: 0.12 Thoracic position: %C: 67%; K: 0.19	Not evaluated.	TR assessment is not appropriate for postural analysis.	1. Position of the wide-angle camera lens that made it difficult to analyze coronal posture. 2. Resolution of the images (640 · 480) was insufficient to discriminate physical landmarks and hence allow postural assessment. 3. Four female participants were unwilling to disrobe for the postural analysis.
Nitzkin, Zhu, Marier 1997	Video recording and image capture	There is no reference to a manual. There is no information about guidance at the time of evaluation.	Coronal and sagittal	Not described.	**Knee**: extension, flexion, girth, edema, Q angle; position, tilt, and rotation of the patella; antalgic gait, circumduction, extension lag, foot pronation, and foot supination. **Neck**: protruded head, rounded shoulders, torticollis, protraction, retraction, flexion, extension, left sidebend, right sidebend, left rotation, and right rotation. **Back**: lordosis in standing, iliac crest level, ASIS level, deformity or lateral shift of pelvic alignment, flexion in standing, extension in standing, left sidebend, right sidebend, flexion in lying, and extension in lying.	**Knee**: %C: 81.4; K: 0.59 **Neck**: %C: 96.0; K: 0.47 **Back**: %C: 90.6; K: 0.68	Not evaluated.	The clinician's experience with TR and the participants' knowledge of the limitations of the system presented very similar results from the RT assessment in relation to the face-to-face postural examination.	1. Clinician experience 2. Simulated environment 3. Brief training 4. Wear shorts, t-shirt and sneakers 5. Participants' knowledge of system limitations. 6. Improvements in equipment

DISCUSSION

The objective of this scoping review was to identify the instruments used to perform static posture assessment through remote care that had their measurement properties evaluated. To the best of our knowledge, this is the first review study with this objective. During the search in the databases for this research, we came across articles that presented methods to perform static postural assessment through remote care but did not present an evaluation of their measurement properties. The measurement properties of the methods of postural assessment alternatives in remote care must be known before their adoption (CABANA et al. 2010; MANI, SHARMA, SINGH, 2021; TRUTER, RUSSEL, FARY, 2014; NITZKIN, ZHU, MARIER, 1997). The existence of only three articles in the searches of Pubmed, Embase and Scopusdatabases demonstrates the scarcity of scientific studies on remote postural assessment; the oldest article was published 22 years ago. Only one of the three articles presented concurrent validity and reproducibility. The other two presented only the concurrent validity measure (TRUTER, RUSSEL, FARY, 2014; NITZKIN, ZHU, MARIER, 1997). The taxonomy of domains and their measurement properties play a key role in interpreting and comparing measurement results in scientific studies. There is some confusion in reporting the measurement properties, probably the result of translation or inadequate interpretation, hence the importance of characterizing the methods of analysis of these studies to ensure their quality. One of the studies, (NITZKIN, ZHU, MARIER, 1997) whose title is "Reliability of Telemedicine Examination," presented concurrent validity when comparing remote assessment with the gold standard. To avoid confusion, we explain the concepts adopted for the measurement properties in the introduction to this review (GADOTTI, VIEIRA, MAGEE, 2006; FURLANETTO, CHAISE, CANDOTTI, LOSS, 2011).

All studies compared remote assessment with face-to-face assessment; two of the three valuable studies (MANI, SHARMA, SINGH, 2021; NITZKIN, ZHU, MARIER, 1997) suggested using posture assessment through remote assistance as an alternative to face-to-face assessment. Despite the promising results for the use of remote posture assessment, neither article detailed the methodological process of image capture, steps that precede the assessment, positioning of the evaluated, or training of the evaluators, nor did they establish evaluation standards for the analyzed segments. These aspects are essential to establish an evaluation similar to the results obtained in person (McINTYRE, ROBINSON, MAYO, 2020, TANAKA, OH, MARTIN, BERKSON, 2020). The parameters for capturing an image are essential in assessing posture by remote assistance. None of the articles describe these parameters, despite reporting that the evaluators would provide full assistance during the evaluation. Tanaka, Oh, Martin, Berkson (2020) suggested a previous checklist with specific instructions to help the evaluated person regarding the positioning of the camera, the person being evaluated, the camera, clothing, lighting and all relevant aspects to improve the quality of the evaluations. Truter, Russel, Fary (2014) suggested that an evaluation by remote assistance is not adequate, based on the results obtained from their statistical analysis, which showed low values of the k and p results. This lack of agreement may be related to some crucial issues for carrying out the postural assessment, such as (1) the imprecision of the assessment procedure of a "normal clinical practice," cited as the gold standard assessment method; (2) the omission of the description of the categorization of postural variables, which seems to have been different for the two different evaluators performing the remote and face-to-face evaluations; and (3) the absence of pre-established criteria for training evaluators.

The training of the people involved, whether professional technicians or those being evaluated, directly impacts the quality of the results obtained (PERETTI, ARMENTA, TAYEBAT, NITTARI, MAHDI, 2017; NITZKIN, ZHU, MARIER, 1997). Of the three articles studied, the two (MANI, SHARMA, SINGH, 2021; NITZKIN, ZHU, MARIER, 1997) that took this aspect into account obtained better results. Truter, Russel, Fary (2014) intended to facilitate assessment and make it an easily applicable method that did not require training; it had a poorer result for assessing posture. Technical and operational difficulties, as well as the identification of bone structures, were some of the limitations presented by the authors. The process of capturing the images, appropriate positioning of the subject and identification of anatomical points are the basis for correct postural assessments (SCHLENSTEDT et al, 2020). Therefore, with the development of technology, this is a path for new investigations in order to seek solutions that facilitate the process of capturing and identifying anatomical structuresin telerehabilitation. The oldest article, from 1997 (NITZKIN, ZHU, MARIER, 1997) was a pioneer and carried out the evaluation through conventional video and photos, while the two most recent articles, from 2021(MANI, SHARMA, SINGH, 2021) and 2014 (TRUTER, RUSSEL, FARY, 2014) used software as an evaluation method. The use of software signals a major trend in the development of information and communication technologies in improving the technical issues of image and sound to carry out the evaluation (SCHLENSTEDT et al, 2020, PERETTI, ARMENTA, TAYEBAT, NITTARI, MAHDI, 2017). Although much of the software being used does not have their measurement properties evaluated, there is a clear tendency to develop these mechanisms to help both the professional and the person being evaluated (SCHLENSTEDT et al, 2020). The request for an assistant was a factor reported in two articles (MANI, SHARMA, SINGH, 2021; TRUTER, RUSSEL, FARY, 2014). In the study by Mani, Sharma, Sing (2021) the researchers instructed the assistant to mark the anatomical points with stickers and then performed the assessment using the photogrammetry method. In the study by Truter, Russel, Fary (2014) the researchers themselves selected an assistant who did not belong to the local clinical staff on the day of the evaluation. Satin and Lieberman (2021) emphasized the importance of having an assistant during the assessment, promoting care and safety for the person being assessed, while Tanaka, Oh,Martin, Berkson (2020) suggested using assistants to help with technical issues, such as organizing equipment and camera positioning.

CONCLUSION

Although postural assessment by remote assistance is commonly performed, few scientific studies demonstrate whether the methods used have their measurement properties evaluated. Of the threearticles included in this scoping review, only one of them presented, together, concurrent validity and reproducibility, while the other two presentedonly the concurrent validity of the postural assessment method.Despite this, two studiessuggested that remote care assessment of the posture of the cervical spine, shoulders, lumbar spine, and knees can be used in clinical practice. These results indicate that there is a need to encourage the development of methods to assess body posture through remote care, as well as research that demonstrates the measurement properties of these methods. Only through valid and reliable methods can an adequate follow-up of the patient's improvement be guaranteed, favoring the establishment of efficient goals and treatments. The findings of this review suggest that there is limited evidence for the adoption of instruments to assess remote static posture. More research is needed to determine the measurement properties of postural assessment methods by telerehabilitation so that they are indeed reliable and effective.

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