Original Article

A Review on reliability of Android goniometer and Traditional goniometer

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DOI: 10.47750/pnr.2022.13.S06.372

Abstract

The brief investigation focuses on the impact of the goniometer that is android goniometer or traditional goniometer.Which formerly check the degree of motion of the joints. Which eventually results in the more accurate and easy use of goniometer. To determine the joint mobility . Physical therapists routinely utilize goniometers to assess range-of-motion (ROM) in the musculoskeletal system. These measureshave been utilized to aid in the treatment and to evaluate therapeutic performance. Smartphone-based apps for sensing joint angles and movement are being investigated using newly developing technology.(1)The traditional goniometer is a typical technique for evaluating the degree of movement . Also it possibly have various limitations, such as the physician's participation of both hands, this leads to hand instability and inaccuracy. Because of their ease of use, smartphones are becoming extremely popular.(2)According to the study, two very different approaches can be used to identify Full range of motion and also the variation in information taken by methods is less than 3.4 percent.(3)

Keywords: Goniometer; degree of motion; Universal goniometer; Android goniometer ; Traditional goniometer; Physical therapist ; musculoskeletal system..

I. INTRODUCTION

The range of motion of seems to be a essential parameter to detecting and diagnosing musculoskeletal impairments, tracking therapy progression, and determining prognosis.(4)Technology has been an increasingly important component of healthcare services in recent decades. With the development and significant advancement of smartphones, health care providers now have ongoing and They have versatile access to variety of new tech.

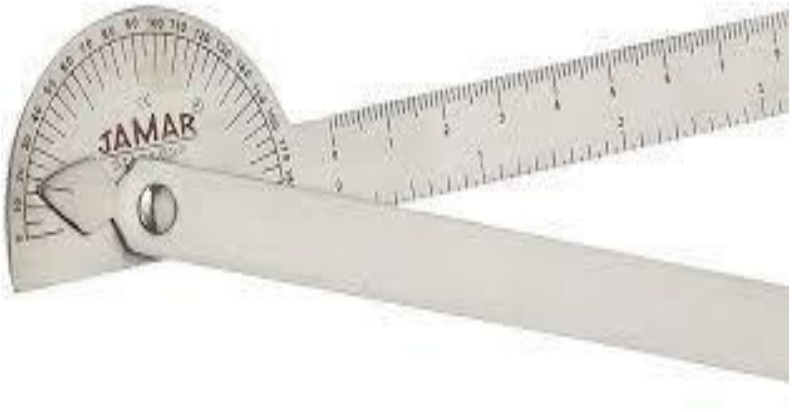
According to general practitioner studies, 81% use a mobile device at work.(5)Various equipment, like as goniometers and inclinometers, can be used to do the measurement. Recent smartphones feature accelerometers and magnetometers, which can be utilised for goniometric tasks via appropriate software

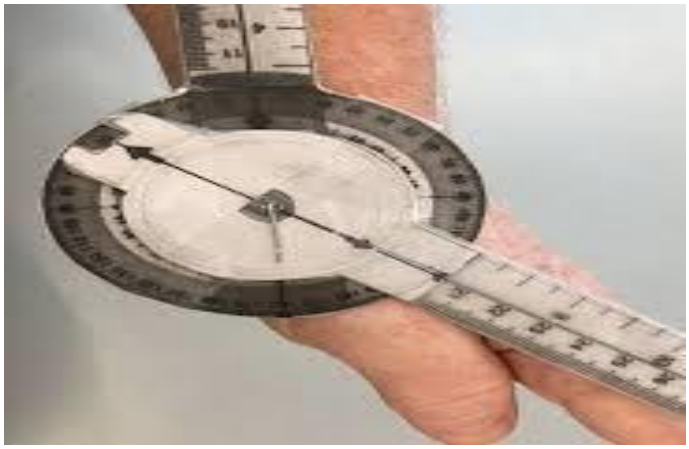
programmes (apps).(6) While there are numerous useful uses for healthcare practitioners to utilise smartphones for, the varying.The absence of quality and control also implies that there are common hazards.. While surveys suggest that a vast majority of This technology is used by healthcare practitioners. just 23% use it.

Report performing any type of risk evaluation prior to utilising a work-related application(5)Many allied health practitioners rely on their ability to assess range of motion of jointAlthough the traditional Goniometer is still the most frequently applied clinical test for measuring joint range of motion, advances in mobile advancements provide doctors with new assessment options.Nevertheless, the accuracy and authenticity of these cellphones and applications remain somewhat in doubt.(7)The Traditional goniometer is a typical methodology for evaluating range of motion (ROM) as part of joint movements. It has various limitations, such as the physician's participation of both hands, which leads to hand instability and inaccuracy. Because of their ease of use, smartphones are becoming increasingly popular.Goniometers are frequently used to assess musculoskeletal range of motion. Clinicians have now access to smartphone goniometry apps.(8)Rapid technology improvements have made the use of android goniometers in assessment investigation and implementation more feasible. Although many physical activity-

related applications are available on various smartphone platforms, only a limited number have been evaluated in research studies to determine their efficacy in gauging muscular strength . The aim of this research is to assess the intra-rater reliability of a mobile phone application for evaluating range of motion in patients(9)The Traditional goniometer is a regularly used standard evaluation instrument for assessing range of motion (ROM) as a component of joint motions. It has particular requirements, such as using both hands of the therapist, which leads to hand precariousness and mistake. Because of their ease of use, smart phones have grown in popularity in the modern day. As a result, for this study, a trial version of the goiniometer application on a smart phone is employed.The study's goal was to compare the quality and validity of a smart phone goniometer app with a traditional goniometer in measuring patients' range of motion.(10)The smartphone application is precise. In comparison to the 3-D

motion analysis system, the Smartphone application displayed outstanding validity for all movements except one, which demonstrated moderate to good validity..(11-25)

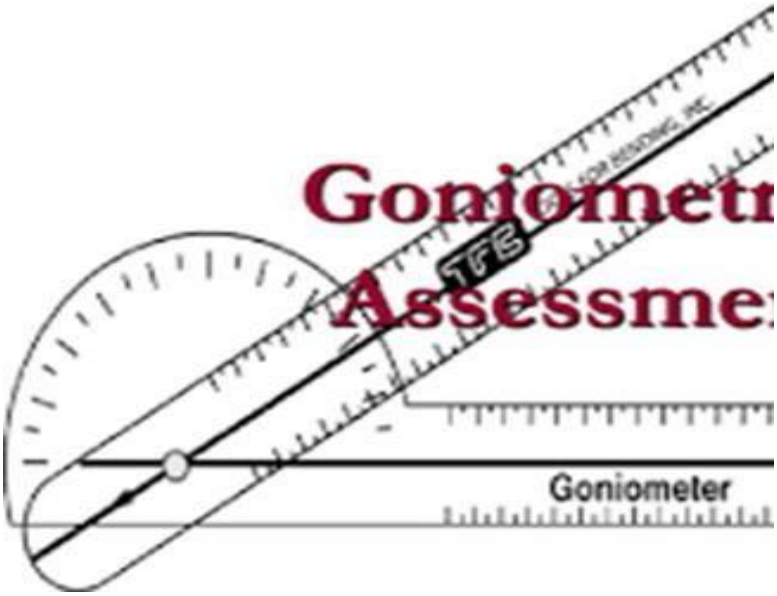




II. DISCUSSION

Several investigations has been undertaken to establish the joint's range of motion. There have been a few papers comparing smartphone and universal goniometer in the measuring of Range of motion of the dominant hand elbow joint as great upper limb joint.(2)The outcomes revealed that both the android goniometer and universal goniometer approaches had high agreement on all movement ratings. Furthermore, the study found that there was a disparity in the measures taken by the physicians using the smartphone approach, which was less than UG. These findings suggested that smartphones have a good level of validity and reliability for measuring elbow joint ROM.These type of experiments had been done in 2012 to compare to Traditional goniometer and inclinometer techniques for evaluating shoulder joint motions. The outcomes demonstrated that the reliability of smartphone measures are comparable to goniometer readings.(2)The use of a mobile phone as a digital inclinometer has many advantages, including facility, low cost of inclinometer apps, and ease measurement owing to

commercial band that secures the device in appropriate positions. As a result, examiners need not require both hands during examinations, and it also allows patients to monitor their own healing process and treatment efficacy from home. also,Kolber et al. In year two thousand twelve he examined the elevation of the shoulder joint at the level of the scapula (Scaption) in a comparable research. The outcome showed much difference of 11° when measuring this angle with a smartphone and a goniometer however, there were smaller variations in this research. On 94 female cases, Mitchell et al.in year two thousand fourteen assessed the usefulness of active motion analysis of the shoulder joint using two methodology: an android goniometer and a traditional goniometer. They showed a strong accuracy of smartphone in assessing shoulder ROM, which is similar to our findings.(26-36)The Smartphone indicated high to outstanding reliability (ICCs>0.75) for four of the seven motions and minimum to good reliability (ICC=0.63-0.68) for the remaining 3. Furthermore, the Smartphone application outperformed the bubble inclinometer in terms of dependability. When comparasion was done,in3-D motion analysis system, the Smartphone application had high validity for all motions except only one, which had minimum to good validity.(6)The discovery of this study suggests that a smartphone may be utilised to assess the active movement of the elbow of the dominant hand with excellent reliability and validity. Determining the degree of impairment is an essential task in legal and forensic medicine. However, findings must be repeated in future research with larger sample sizes. Some advantages of this approach appear to include the ease of use of cellphones by patients and clinicians, as well as the device's acceptable consistency in measuring ROM. Though android goniometer had several benefits in measuring joint range of motion it may have technical issues which may lead to barrier in assessment.



III. Conclusion

This study focuses on verified goniometer applications that therapists and other health care practitioners may use in research and clinical practise with confidence.(12)Because of their strong established as a means and internal consistency reliability, android goniometers may be utilised to quantify active Range of motion of the any joint.(4)The discovery of the study suggests that these devices may be utilised as an additional resource to analyze joint mobility ranges. We can enhance, develop, and display the outcomes of combined studies because of technical advancements.(13)This concludes that the android goniometer is more easy to use to assess the range of motion than the traditional goniometer. As the android goniometer is fast, accurate and reliable way to calculate the range of motion in patients joints. Evidences.

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