



ELSEVIER

Contents lists available at ScienceDirect

Journal of Hand Therapy

journal homepage: www.jhandtherapy.org

JHT READ FOR CREDIT ARTICLE #320.

Practice Forum

Using smartphone applications as hand therapy interventions

Lori Algar OTD, OTR/L, CHT^{a,*}, Kristin Valdes OTD, OT, CHT^b^a Northeast Orthopaedic and Hand Surgery, 60 Westwood Ave. Suite 300, Waterbury, CT 06708, USA^b Rocky Mountain University of Health Professions, Provo, UT, USA

ARTICLE INFO

Article history:

Received 10 December 2013

Accepted 25 December 2013

Available online 4 January 2014

Keywords:

Smartphone applications

Hand therapy intervention

Proprioception

Trapeziometacarpal arthrosis

Distal radius fracture

Range of motion exercise

Neuromuscular training

Gaming

ABSTRACT

In the hand therapy clinic, smartphones can be used as an educational resource, to view a photo or video of a home exercise program, or as a method of electronically documenting progress related to healing from an injury. Smartphone applications may also serve as appropriate therapy interventions to address deficits often presenting with common hand injuries. For individuals with trapeziometacarpal arthrosis, gaming can encourage radial abduction range of motion and neuromuscular control required for joint stability. People with distal radius fractures may benefit from smartphone applications for range of motion and proprioceptive training. These treatments may assist with addressing client-centered goals and be motivating in the current technology driven times.

© 2014 Hanley & Belfus, an imprint of Elsevier Inc. All rights reserved.

Often, when we think of gaming systems, texting, and smartphones, we think of potential overuse problems that can result with excessive use of such devices. These authors demonstrate that this modern technology can also be useful as an adjunct to traditional therapy. Examples are given on how and why we could incorporate gaming devices into a treatment plan for individuals with trapeziometacarpal arthrosis and for individuals following a distal radius fracture – Victoria Priganc, PhD, OTR, CHT, CLT, Practice Forum Editor.

Introduction

During our personal lives, we may find ourselves increasingly utilizing and relying on smartphones. In the hand therapy clinic, our clients likely have smartphones and can use these as an educational resource, to view a photo or video of their home exercise program, or as a method of electronically documenting progress related to healing from a hand injury. Can we additionally consider using applications on our smartphones as appropriate therapeutic interventions for conditions commonly treated by hand therapists?

Using smartphone applications for treatment of trapeziometacarpal arthrosis

Some smartphone applications, such as Fruit Samurai and Catch the Fish (Figs. 1 and 2), require both palmar abduction and the unconscious activation of thumb muscles to “swipe the fruit” or “catch the fish.” There is research evidence^{1–5} that suggests the appropriateness of prescribed range of motion exercises, including active palmar abduction of the thumb and proprioception, for individuals with trapeziometacarpal (TMC) arthrosis. The pain and decreased range of motion experienced by these individuals interfere with function^{6–8} and are related to the progression of TMC arthrosis.^{4,5} There is a relationship between decreased pain and improvement in physical function, stiffness, and perception of symptom impact on status in individuals with hand osteoarthritis (OA),⁹ thus pain should be a primary concern when treating clients with OA.¹⁰

Exercise is beneficial to individuals with hand OA, including TMC arthrosis, to assist with increasing range of motion and grip strength and decreasing pain.^{1,2} The TMC joint requires both stability and mobility and is dependent on a combination of static stability from ligaments and dynamic stability from muscles moving the joint.³ Recent biomechanical analyses^{3–5} of the TMC joint have demonstrated that this joint's ligaments are important

* Corresponding author. Tel.: +1 203 597 1609; fax: +1 203 597 1581.

E-mail address: Lori.algar@gmail.com (L. Algar).

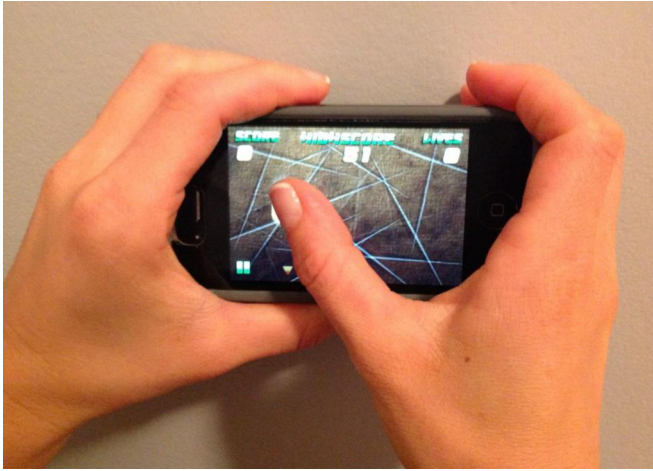


Fig. 1. Fruit Samurai.

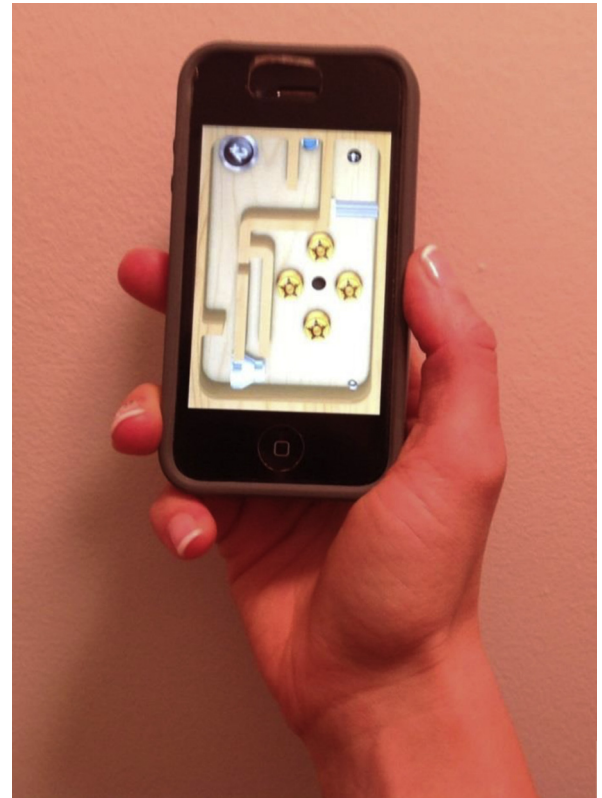


Fig. 3. Labyrinth.

contributors to neuromuscular stability via their actions of signaling joint motion and position. Therefore, poor proprioception and neuromuscular control may contribute to the development of TMC arthrosis.^{4,5} The suggested therapeutic intervention to improve neuromuscular control and proprioceptive sense of the thumb is conscious neuromuscular training to promote dynamic joint stability and rehabilitate muscles that reduce dorsoradial subluxation and instability.⁵ Thus, the appropriate use of smartphone applications that facilitate neuromuscular control, such as Fruit Samurai, Catch the Fish, or other similar smartphone applications, may serve as a valuable component of a hand therapy program for an individual with TMC arthrosis.

Using smartphone applications for treatment following distal radius fracture

Smartphone applications including Labyrinth (Fig. 3) and Tilt Maze (Fig. 4) demand wrist proprioceptive and joint sense exercise from the user. These applications also require active wrist movement in order to navigate a ball through the game screen. Limitations in wrist movement are common following a distal radius fracture. Additionally, proprioceptive deficits may also be present.¹¹

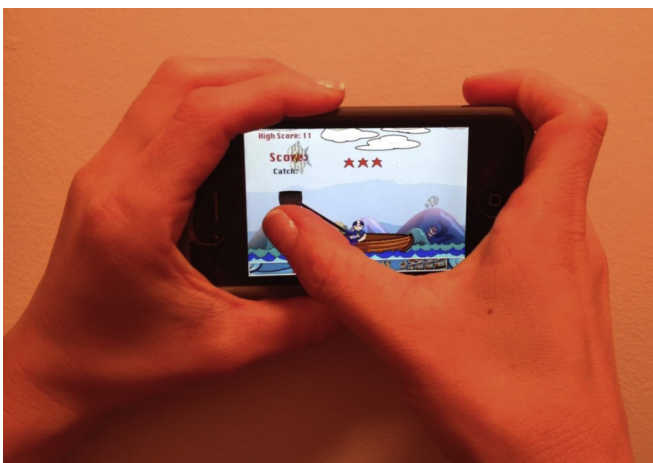


Fig. 2. Catch the Fish.

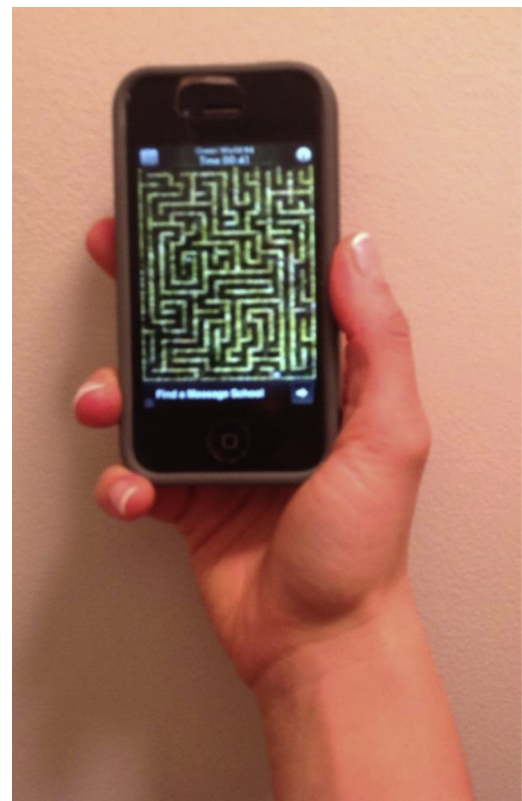


Fig. 4. Tilt Maze.

Download English Version:

<https://daneshyari.com/en/article/2698214>

Download Persian Version:

<https://daneshyari.com/article/2698214>

[Daneshyari.com](https://daneshyari.com)