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Article Title: A Pilot Study: Psychological Effects of the Voodoo Floss Band on Glenohumeral Flexibility

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Title

A Pilot Study: Psychological Effects of the Voodoo Floss Band on Glenohumeral Flexibility

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Key Points

- There is limited evidence on the effects of the Voodoo Floss Band.
- Voodoo Floss Bands provide a psychological increase in glenohumeral flexion.
- Voodoo Floss Bands provide no physical improvement in glenohumeral shoulder flexion.
- Perception of the effects of Voodoo Floss Band leads to significant clinical implications.

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ABSTRACT

Even though adaption of the Voodoo Floss Band is gaining momentum, evidence based literature on its effectiveness remains sparse. The purpose of this quantitative observational design study was to investigate the effects of the Voodoo Floss Band on soft-tissue flexibility and perception of movement. A repeated measures ANOVA with between subjects factor demonstrated both groups significantly improved GH flexion range of motion from pretest to posttest but there was not a statistically significant difference between the groups. Perceptions of flexibility increased more for the Voodoo Floss Band group demonstrating a psychological increase in GH flexion, but not a physical increase.

Key Words: Myofascial release, compression, stretching, motion

INTRODUCTION

Soft tissue flexibility is considered essential to normal biomechanical functioning in athletics. [1] Studies report improved athletic performance, reduction of injury, improved coordination, and decreases in post-activity muscle soreness, pain, and stiffness all to be associated with increasing flexibility.[1-3]

One mode of increasing relative tissue mobility for overall flexibility gains is to focus on the fascial layers within the neuromuscular system in a therapy technique called myofascial release.[4] Myofascial release involves placing direct pressure on the soft tissue of a muscle to cause some form of ischemic compression and adding either a stretch or sweeping movement of the tissue promoting breaking up of fibrous adhesions between the layers of fascia and restoring the soft-tissue extensibility.[5] This therapy technique can be self-administered through techniques such as foam rolling, or clinician administered, through things such as massage or trigger point release.[4]

A relatively new tool in the clinical environment is the Voodoo Floss Band which is a 7' X 2" latex band. Originally developed by Kelly Starrett for use in the lifting community as a method of wrapping a muscle group tightly while stretching or performing certain exercises with the goal of improving mobility and strength, the Voodoo Floss Band is now being used by some athletic trainers and athletic therapists in treatment and rehabilitation. In some instances, clinicians are now essentially using this tool as a mode of myofascial release to provide ischemic compression in order to address a variety of conditions. The Voodoo Floss Band has been subjectively reported to be unique from other compressive bands such as the ACE wrap because it adheres better to the skin without slipping and applicants can get the band tighter than other wraps which provides stronger direct pressure on tissue that could lead to a better myofascial release.[5]

Even though adaption of the Voodoo Floss Band seems to be gaining momentum within the clinical therapists' community, evidence based literature on its effects remains spare. The purpose of this quantitative descriptive laboratory study was to investigate the effects of the Voodoo Floss Band on soft-tissue flexibility and perception of movement. Three hypotheses were developed for this study; 1) Use of the Voodoo Floss Band will increase glenohumeral flexion active range of motion (GH flexion AROM) among participants, 2) Participant self-ratings of shoulder flexion motion ability will increase as a result of using the Voodoo Floss Band, and 3) Participant self-ratings of shoulder flexion motion speed will not increase as a result of the Voodoo Floss Band.

METHODS

Participants

The study employed a descriptive laboratory study with randomization in which participants reported for a single data collection session. Following institutional IRB approval, participants were recruited from a division 1 university in the Midwest through verbal announcements. Participants included a convenience sample (n = 60) of 18-24 year olds and were randomly assigned to either a control group (n = 30) or an experimental group (n = 30). Following written consent, inclusion criteria of no current pain in or around the dominant shoulder, no history of shoulder surgery, and no latex allergy were reviewed with each participant. All 60 participants (100%) were included in the study.

Instrumentation

Perception of the intervention was measured using a five-question survey instrument with a six-point Likert scale with responses ranging from 0 (no change) to 5 (dramatic change). All questions related to how well the participant perceived the band (pre-wrap used on the control group or Voodoo Floss Band used on the experimental group) made them feel or allowed them to move following the application of this band and concurrent stretching (Figure 1). A panel of experts (n = 5) examined the instrument for content validity. All experts were certified athletic trainers with more than 10 years of clinical and research experience. Based upon the expert feedback, no modifications to the instrument were deemed necessary.

Tasks

The child's pose stretch is completed from a bent knee position on a hard surface by actively flexing the arms overhead and pressing palms into the floor until a stretch is felt on the posterior shoulder (Image 1). All participants were asked to perform five sets of thirty seconds child's pose stretches with 7 feet of either pre-wrap or the Voodoo Floss Band applied directly to the skin on the dominant arm/shoulder (one used for writing).

Procedures

Pre-intervention measurements of glenohumeral (GH) flexion were measured using a goniometer where participants were asked to lie supine and actively flex their arm overhead to the end range of motion (ROM). The goniometer was aligned as follows: center of the fulcrum in line with the acromial process, proximal arm aligned with the midaxillary line of the thorax, and distal arm aligned with the lateral midline of the humerus using the lateral epicondyle for reference.

The participants were then randomly assigned to one of two groups; pre-wrap (control) and Voodoo Floss Band (experimental). The control group had pre-wrap (underwrap) applied directly to the skin on the dominant arm/shoulder and the experimental group had the Voodoo Floss Band applied at a 50% tension applied perpendicular to the deltoid muscle and directly to the skin on the dominant arm/shoulder. Following this and while wearing the band, the participants were instructed to hold a child's pose stretch for five sets of 30 seconds.

Immediately following the stretch, the band (pre-wrap or Voodoo Floss Band) was removed from the participants' dominant arm and a post-intervention GH flexion measurement was obtained by asking the participant to again actively flex the shoulder to the end ROM. Efforts were made to reduce investigator bias by having one investigator apply the bands and the another investigator take measurements thus blinding the investigators.

The participants were then asked to complete the five-question survey about their perception of the intervention before being dismissed.

RESULTS

Initial data screen for assumptions showed that for the within subjects component, Box's Test of Equality of Covariance Matrices was significant (M = 25.59, F(3, 605520) = 8.21, p < .001), indicating that the assumption that the ROM covariance matrices were equal across groups was violated. Therefore, a Greenhouse-Geisser correction was applied when interpreting the ROM findings. Levene's Test of Equality of Error Variances did not differ significantly (F(1,58) = 3.62, p < .062), indicating that the assumption of homogeneity of variance was not violated. No correction was applied for the between subjects component.

A repeated measures ANOVA with between subjects factor (group) was used to test whether use of the VooDoo Floss Band would increase GH flexion AROM among participants.

Range of motion (in degrees) was measured by goniometer and was expected to increase on the posttest if the VooDoo Floss Band was effective at increasing GH flexion AROM. The main effect for the experimental and control groups was not statistically significant (F(1,58) = 2.79, p = .10, η2p = .046), indicating that the groups did not differ at the pretest or posttest.

There was a statistically significant main effect for the improvement in GH flexion ROM from pretest to posttest ($F(1,58) = 33.22$, $p < .001$, $\eta^2_p = .364$)., but there was not a statistically significant interaction of improvement of ROM by group ($F(1,58) = 0.145$, $p = .705$, $\eta^2_p = .002$), indicating that both groups improved in ROM the same amount. GH flexion ROM increased for both groups from pretest to posttest, but the VooDoo band group did not increase more than the control group.

Two additional research questions were examined to assess patients' perceptions of increased flexibility as the result of using the VooDoo Floss Band. An independent samples *t*-test was used to determine whether patient self-ratings of motion ability increased as the result of using the VooDoo Floss Band. Motion ability was calculated from the mean of four items relating to ease of motion, reach, height, and overall improvement (Figure 1). Perceptions of flexibility increased more for the Voodoo Floss Band group, $t(58) = 2.24$, $p = .029$.

The second additional research question asking perceptions of improvement in motion speed was included as a control. Motion speed was not expected to change, but this item was included to test for a possible halo effect regarding the VooDoo Floss Band and distinguish whether patients were reporting actual effects accurately. Motion speed was rated with a single item (Figure 1). Perceptions of speed did not increase differently for the two groups, $t(58) = 1.10$, $p = .275$.

DISCUSSION

The current study suggests that compression wraps on an uninjured joint while simultaneously actively stretching is not an effective form of myofascial release to directly improve soft tissue flexibility.

Self-rated perceptions of shoulder flexion flexibility increased as a result of the Voodoo Floss Band. In a systematic review of effective health outcomes, Stewart[7] found a significant correlation between a patient's perception of treatment effectiveness and improved health measured by physiologic functions (blood pressure, glucose), emotional health, symptom resolution, and pain control. Further, it is accepted in healthcare and medical practice that a patient will have better adherence to a treatment plan if they perceive that intervention to be effective. [7-10] It can be concluded from these studies as well as the current research, that the placebo effect a patient may experience from a treatment can strongly impact attitudes and adherence.

Limitations

This study is limited on its generalizability as the sample size was small and included measurements from one specific joint of the body and one specific stretch. Therefore, it cannot be assumed when applied to other joints in the body or utilization of other stretches, the same results would apply.

The child's pose is a multi-joint stretch that has been demonstrated to improve shoulder flexion ROM[11], but also stresses the low back and hips thus any mobility restriction participants had in these areas could have limited their ability to stretch the shoulder. This stretch was selected for this study due to the theory that myofascial tissue connects body-wide continuities and therefore joints do not function in isolation[12].

Finally, baseline AROM measurements were near 180 degrees which is close to normal and could represent a ceiling effect for GH flexion AROM.

Clinical Implications

The significant clinical implication of these findings is that while there were no statistically significant gains in utilization of the Voodoo Floss Band on GH flexion AROM, the participants subjectively felt as if this device was effective. Perceptions of ease of shoulder flexion motion, reach, height, and overall improvement is significant because the participants perceived that the Voodoo Floss Band was significantly and positively impacting their ability to move. When a patient perceives a treatment to be effective, they will have better adherence to a treatment plan and may also experience actual improvements within their overall health. Therefore, even though the Voodoo Floss Band was not demonstrated to have a positive effect on GH flexion AROM in this study, an athletic trainer or athletic therapist may still find use in utilizing this tool to achieve soft tissue flexibility goals with their patients.

Future Research

This study examined the Voodoo Floss Band as a method of providing compression for myofascial release within a very specific population and a very specific intervention. From this study information, new insights can be explored on the effects on patient adherence and health as a result of utilizing the Voodoo Floss Band within a variety of applications. Additionally, future research needs explore additional applications of the Voodoo Floss Band as literature is currently very sparse.

CONCLUSION

The significant finding in this study is participants perceived an increase in shoulder flexibility with the Voodoo Floss Band as compared to pre-wrap. These findings indicate that a clinician would be able to use the Voodoo Floss Band as a means of creating a placebo effect in their patients to think that they are able to increase their ROM. While this study is limited in measuring a very specific population across a very specific intervention, it is important to consider the positive effects that a tool such as this may have on the overall perception a patient may have with a treatment plan.

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Figure 1: Perception Survey

0 – no change	1 – some change	2 – noticeable change
3 – mild change	4 – moderate change	5 – dramatic change

1. The band allowed me to move my arm easier than before.
   0 1 2 3 4 5
2. The band allowed me to move my arm farther back behind my head than before.
   0 1 2 3 4 5
3. The band allowed me to move my arm faster than before.
   0 1 2 3 4 5
4. The band allowed me to move my arm higher than before.
   0 1 2 3 4 5
5. The band allowed me to move my arm better (overall) than before.
   0 1 2 3 4 5

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Figure 2: Range of motion scores from pretest to posttest

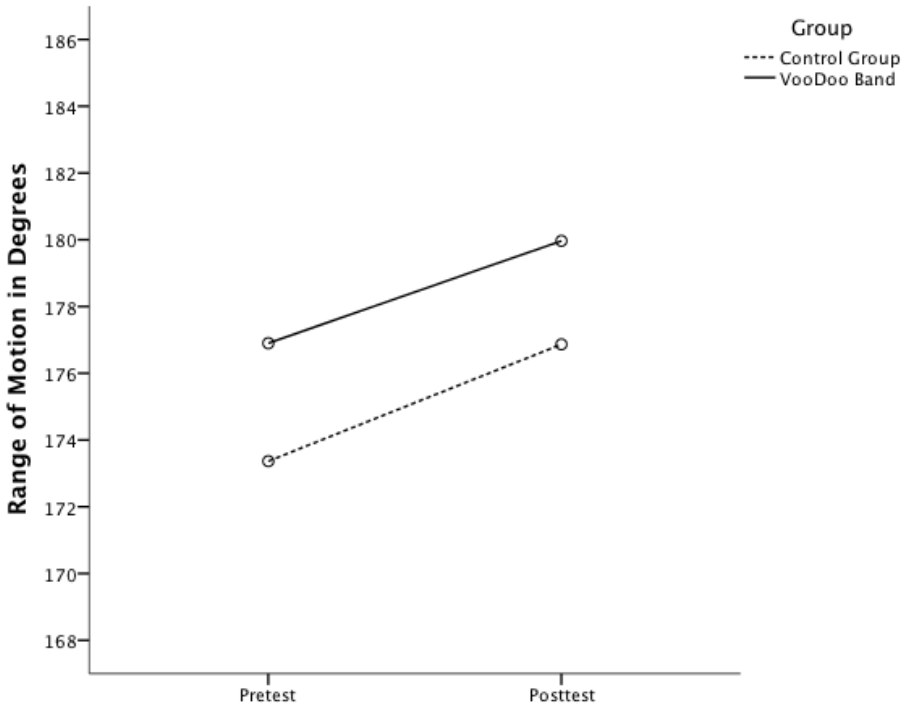

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Image 1: Child's pose stretch with Voodoo Floss Band applied