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Assessment of an Innovative Posture Science Active Wear on Division One Collegiate Student Athletes

Irene Toh[1], **Seiya Liu**[2*], **Hale Furey**[2] **and Earl Brien**[1]

[1]*Cedars-Sinai Medical Center, Los Angeles, CA, USA*

[2]*Harvard University, Cambridge, MA, USA*

***Corresponding author:** Seiya Liu, 11301 W Olympic Blvd #558, Los Angeles, CA 90064, USA, Tel: +1 424 535 3123; E-mail: Marinmomo@gmail.com

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Abstract

National Collegiate Athletic Association (NCAA) Division One student-athletes often experience back and shoulder injuries, among other musculoskeletal injuries, which can be stressful and difficult to recover from. Many injuries are sports specific, e.g., contact vs. non-contact or gender related, but most back and neck injuries can become chronic in nature. Often these injures can lead to less than desirable physical and emotional well-being. The current study aims to assess the user experience of 47 NCAA Division-One athletes for daily functional active wear technology designed to provide instant posture correction and immediate chest expansion to improve thoracic mobility and physical wellness. Results showed that 100% of the subjects were satisfied with the comfort level of the posture active wear, and 95% felt their posture improved after wear. Furthermore, over 90% of subjects would wear the posture active wear daily as well as recommend it to others. 80% of the subjects would wear the posture active wear for exercise, 92% liked the feel of the fabric, and 90% would like to use it as adjunct to physical therapy. Overall, the results of the current study indicate that competitive athletes find the tested posture active wear comfortable, effective in instantly correcting posture, would use it during exercise, would highly recommend it to others, and would use it as an adjunct to Physical Therapy. Overall this apparel is a promising option for posture correction, injury prevention and physical therapy for student athletes and further supports previous literature on the IFGfit™ posture correcting active wear.

Keywords: Posture correction; Functional active wear; Preventative health; Injury prevention; Student athletes; Sports injury; Musculoskeletal injury; Physical therapy

Introduction

Back and neck injury and poor posture are one of the greater threats to student athletes, as injury can impact their athletic and professional career, can influence their athletic scholarships, and in many cases can be the sudden end to a promising career, not to mention the cause of serious physical and emotional pain.

A study by Watson on soccer, rugby and football players examined the relationship between posture and injury, finding that only about a quarter of the athletes studied had preserved lumbar spine alignment (1995), meaning that most were not well aligned [1]. Watson also found that around half of the soccer players he studied had hyper lumbar lordosis, or swayed back posture, and found that this posture condition was correlated with increased incidence of musculoskeletal injuries [1].

Another study by Watson on soccer, Gaelic football and hurling athletes found, similarly, that posture was among the many predictors of injury in his participant sample over the course of a two-year investigation [2]. Many such injuries are only temporary and can be recovered from, but in many cases, the consequences can last a lifetime, and preventative measures should be taken to avoid injury at all costs.

In addition, poor posture has a detrimental effect on physical recovery after exercising. A 2006 study from the American Academy of Physical Medicine and Rehabilitation showed that poor posture, such as slumping, produced the worst lung capacity and expiratory flow compared to normal sitting and a posture designed to mimic standing spinal alignment [3]. Rene Cailliet, former director of the department of physical medicine and rehabilitation at the University of Southern California, asserts that the reduction in lung capacity can be as much as 30 percent [4].

A steady intake of oxygen is crucial for long-term and short-term health. As Thibodeau mentions, without enough O^2, you're at risk for issues like fatigue and even stress on your heart. And when your heart and lungs are stressed, that can activate a more overall stress response through the body, elevating cortisol. Elevated cortisol is associated with a host of conditions, such as weight gain, mood swings and trouble sleeping. It also links to a shutdown of the executive functions of the brain, meaning you can forget about great decision making or real focus [5].

In another article, Heid pulls a quote from Marilyn Moffatt, a professor of physical therapy at New York University (2019) "Posture isn't just about aesthetics; it's about keeping the entire body functioning normally" p. 1 [6]. Heid goes on to explain that experts say posture plays an important role in both physical and psychological health [6]. Poor posture can make it difficult to turn your head or raise your arm, is linked to low mood, and can even compress the inner abdominal organs [6].

Wendy Katzman, a professor of physical therapy at the University of California, San Francisco mentions that popular posture-correcting gadgets don't have much evidence backing their benefits and also don't give good feedback when slouching such as let you know when you're

slouching so that you can correct your posture [6]. The IFGfit posture active wear is a direct remedy to both of these pain points that 'gadget' type posture-correction items do not do in that it

- Has clinical evidence and
- Natural feedback when slouching until you are in correct postural position, at which point the feedback will cease.

Given the prevalence of posture related injury and pain among serious athletes, an easily accessible and cost-effective solution that is both preventative and therapeutic is necessary to mitigate its personal and financial costs. Traditional conservative methods of physical therapy, such as chiropractors, modality, bracing, and taping are time consuming and not cost effective for many student athletes. There is a need to provide an alternative preventative, and potentially therapeutic, solution for student athletes with neck, back, and shoulder complaints.

In addition, previous posture correcting clothing has attempted to address these issues, but almost all of these products are compression garments or constraining devices, the design and use of which differ greatly from the IFGfit™ posture active wear apparel of the current study, which does not have a compression construct. Garments that target compression can be tight, hot, and uncomfortable as active wear. Additionally, compression garments provide limited chest expansion functionality and their long-term wear may pose health risks.

Thus far, the data evaluating posture recovery and training apparel are limited, and user experience has not been well documented. The IFGfit™ (Los Angeles, CA, USA) posture active wear is a dynamic posture training and recovery garment that naturally, instantly, and continuously corrects posture while expanding the chest for better breathing and recovery.

In a previous study, Matsumura et al. found that EMG data showed decreased activity in the middle trapezius and increased activity in the erector spinae muscle groups, including the symmetry of shoulder blade kinematics during wear, thus showing the positive effects that the IFGfit™ posture active wear has on instantly inducing proper posture [7]. Additionally, the active wear continues to train the muscles to work for the wearer during use, with a host of ancillary benefits such as spinal extension to feel taller, deeper breathing during chest expansion, and the boosting of athletic performance and recovery.

Motivation for the current study was based on a previous study by Brien et al., in which the IFGfit™ posture active wear showed over 90% of participants reported a good or excellent comfort level; however, the previous study did not address usage by student athletes or use of the garment for exercise [8]. In the current study, we aim to assess the student athletes' user experience in order to understand the potential of this dynamic posture active wear to be used by athletes as a preventative and therapeutic tool that can help to reduce the prevalence of posture related musculoskeletal injury.

Methods

Participants

Forty-seven NCAA division one student athletes participated in the study. Participation was voluntary. Participants ranged from 18 to 24 years of age.

Materials

IFGfit™ posture active wear tops were used for the study. The posture active wear is designed and crafted in the USA. The active wear is made of an inner shirt with engineered fabrics to provide an instant and continual horizontal tension.

Posture, Performance, Recovery (PPR)® technology, and the outer shirt is made from a fashionable, eco-friendly tencel fabric. Both inner and outer portions work together to provide natural, instant and continual posture correction and chest expansion. After wearing the IFGfit™ posture active wear, participants were required to fill out a follow-up questionnaire, which was also used in the study by Brien et al. and was revised for the purpose of the study [8]. The survey included questions about participants' posture improvement and comfort, as well as their thoughts on using the shirt for exercise, the feel of the fabric, whether they would recommend the garment to others, and other related questions.

Procedure

After volunteering to participate and giving their consent, all participants wore the IFGfit™ posture active wear until they decided to remove it, between 5-20 minutes. After trying on the posture active wear, all participants were given as much time as they needed to fill out the follow-up questionnaire in private. Confidentiality of the participants were ensured in that all participants filled out individual surveys.

Results

This study aims to evaluate the IFGfit™ instant posture correcting apparel on division one student athletes. The main findings from the survey were participants' reports on their comfort level while wearing the garment and whether they perceived a change in their posture while and after wearing the garment.

We calculated a total comfort level score for analysis by taking the sum of the answers to questions 15 through 19 and dividing the resulting score into four categories of comfort: excellent, good, satisfactory and poor. The improvement score was simply the answer to question 20 – "After wearing the apparel, did you feel an improvement in posture?" Results on comfort level survey showed 100% of students were satisfied with the comfort of the garment. The comfort level results are illustrated in Figure 1.

Figure 1: Participant's comfort level.

Additionally, over 90% of the subjects reported that they felt their posture had improved. The posture improvement results are illustrated in Figure 2.

Figure 2: Participant's perceived posture improvement level.

Additional results included responses to the questions: "Do you think wearing this active wear would you help you in your daily activities?" to which 46 participants (97.9%) responded "Yes" "Would you recommend this active wear to someone else?" to which 44 participants (93.6%) responded "Yes," "Would you consider using this posture active wear as part of your physical therapy or recovery?" to which 42 (89.4%) participants responded "Yes" and 2 (4.3%) responded "No," and three did not respond; "Do you like the feel of the fabric?" to which 43 participants (91.5%) responded "Yes," and four participants (8.5%) responded "No;" "Do you think the shirt is breathable?" to which 39 participants (83.0%) responded "Yes" and six participants (12.8%) responded "No," and two responded "Maybe;" and finally, "Would you wear the shirt while exercising?" to which 39 (83.0%) responded "Yes," six (12.8%) responded "No," and two did not respond. The above results are illustrated in Figures 3-5.

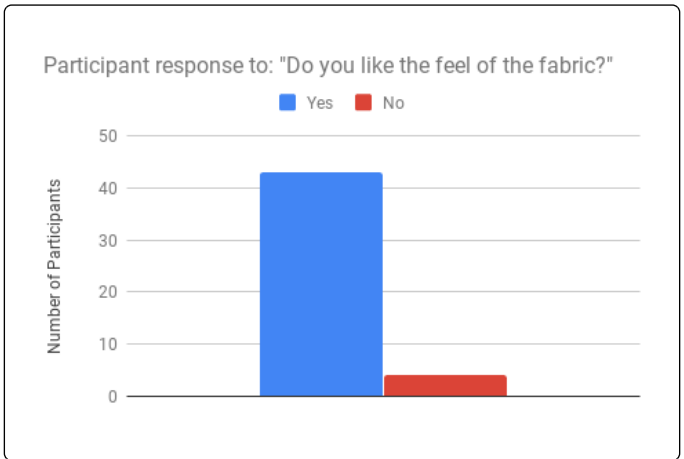

Figure 3: Athlete's response to posture correcting garment.

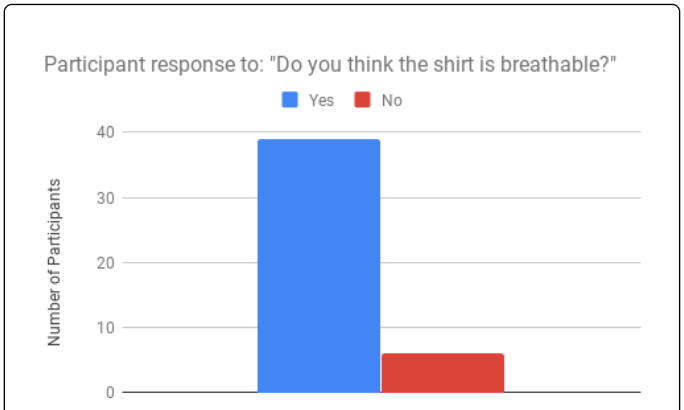

Figure 4: Participant's response to "Do you think the shirt is breathable".

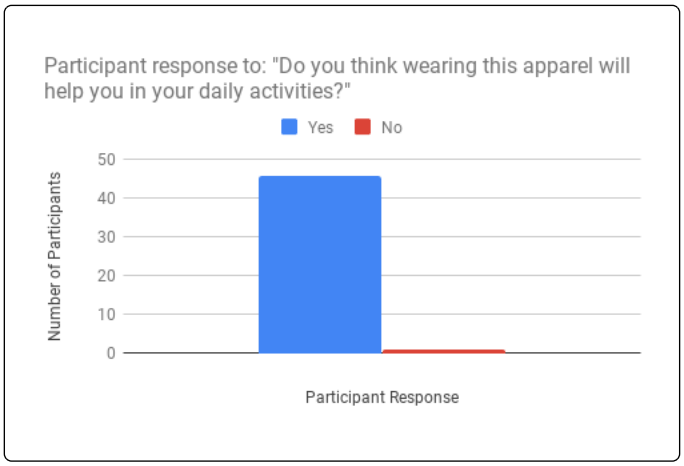

Figure 5: Participant response to "Do you think wearing this apparel will help you in your daily activities".

Discussion and Conclusion

In the current study, we were primarily interested in the student athletes' subjective responses to an instant posture correcting apparel, including whether they found the apparel comfortable and whether they felt an improvement in their posture while and after wearing the apparel. All subjects were satisfied with the comfort level of the apparel. Additionally, 95% reported feeling that their posture improved and only 2% did not feel an improvement in posture. These findings are consistent with the previous study by Brien et al., which found similar comfort level and posture improvement results in non-athletes [8]. The responses of the current participants, however, are especially encouraging given the participants' significant experience with athletics, which indicates a knowledge of and investment in one's body that the general population might not have. While the study may have suffered from a homogeneous sample size age range of 18-24 years old, it did cover a wide range of student athletes from various sports, male/female, and differences in preference for athletic apparel; therefore, the study provides a strong base of data that should be further researched across a broader population to strengthen external validity.

In order to further understand the participants' response to the shirt, they answered a number of other questions: whether they

thought the shirt could help in their daily activities, whether they would use it as a part of their standard physical therapy, whether they liked the material and thought it was breathable, whether they would wear it while exercising and whether they would recommend it to someone else. For all six of these questions, over 80% of participants responded positively. Over 90% said that they thought the shirt would help in their daily activities and that they would recommend it to someone else, and about 90% said that they would consider using as a physical therapy or recovery option and that they liked the feel of the fabric. Overall, these results are very positive, and indicate that the athletes would be interested in using the IFGfit™ apparel as a part of their daily and athletic routines. Furthermore, while the study was conducted on athletes, the effects of the active wear are not limited to just athletes. The posture active wear is meant to provide support for posture, performance, and recovery i.e., breathing; thus, the active wear can be used in any population. There are no strict rules for use, as the posture correcting effects are instantaneous; however, if used for recovery purposes, the active wear can heavily assist with chest expansion for taking deeper breaths, therefore more quickly recovering. This means that the active wear should be worn for as sufficient a time necessary to properly recovery, varying on a per person basis. Longer term effects of the posture active wear are of great interest and are still being researched, hinting at larger implications for a potential therapeutic option, though there has not been an official study done on this manner yet. This is not to undermine or de-emphasize the importance of physical therapy or similar treatment methods for serious injuries, but rather to highlight the importance and benefit of preventative measures that the IFGfit posture active wear can provide.

Future research should put these results to the test by having the athletes wear the IFGfit™ garment during their athletic activities in order to more accurately assess their athletic response to the garment. Additionally, longitudinal studies could eventually be done to assess the garments ability to improve athletic performance over time.

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