Author's response to reviews

Title: Clinical Descriptive Measures of Shoulder Range of Motion for a Healthy, Young and Physically Active Cohort

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Author's response to reviews:

Reviewer 1

General comments:

This paper is fairly good in terms of the method of measurement, presentation of the results, and discussion on the advantage and disadvantage of the current study. However, there are still important issues that should be revised.

We sincerely thank reviewer 1 for his/her positive compliments in the general comments pertaining to the information presented within this manuscript. We thank reviewer 1 for his/her time and expertise in the peer review of our manuscript submission. We also appreciate the reviewer’s acknowledgment for the recognition to establish descriptive clinical shoulder range of motion (ROM) measures in a physically active population for musculoskeletal research literature and sports medicine practitioners per appraisal for the level of interest. We recognize that our initial manuscript submission requires various edits per the reviewer’s comments and we’re confident that our associated responses as well as document amendments adequately address these related concerns. We trust to have satisfied all the issues presented by reviewer 1 and propose these modifications have significantly strengthened the quality of our re-submission.

Specific concerns:

1. Major Compulsory Revision:

The authors described about "glenohumeral joint" motion, but apparently the motion they measured is a total shoulder motion, i.e., the sum of glenohumeral and scapulothoracic motions. So, please use the simple term “shoulder motion” instead of "glenohumeral joint" motion.

We acknowledge this critique and are in agreement with reviewer 1 that “shoulder complex motion” is a better term to use throughout the manuscript, which more appropriately reflects the physical measures we took for this investigation. Therefore, per recommendation of the reviewer, please find that we
have exchanged use of “glenohumeral motion” for “shoulder complex motion” throughout the entirety of the manuscript. We trust this correction satisfies this particular important point.

2. Major Compulsory Revision:

The authors showed statistically significant differences between men and women, or between dominant and non-dominant arms. However, even the difference of one degree can be statistically significant with a sufficiently great number of samples. Please clarify how much difference is clinically significant. If the difference of more than five degrees is supposed to be clinically significant, all the differences shown to be significant in the current study are not significant at all.

We agree with reviewer 1 that due to the large sample size in our study, even small mean differences in ROM by arm dominance and sex likely reached statistical significance. However, it remains unclear what the minimum clinically important difference is for shoulder complex ROM measures, particularly in a young athletic population with considerable upper extremity demands. We attempted to address this point on page 7, lines 146-159 of the revised manuscript.

Reviewer 2

General comments:

Authors described clinical glenohumeral joint (GHJ) range of motion measures for a young, healthy, and physically active population. These data could provide information of potentially identifying clinical deficiencies and functional outcomes following shoulder injury in sports medicine practitioners.

This is a basic and important study for assessing clinical deficiencies and functional outcomes following shoulder injury in athletes. Before publication, authors should clarify following points.

We sincerely thank reviewer 2 for his/her compliments in the general comments pertaining to the information presented within this manuscript as applicable to clinicians and researchers alike. This was and remains our intention in the generation and dissemination of this Short Report. We thank reviewer 2 for his/her time and expertise in the peer review of our manuscript submission. We also appreciate the reviewer’s acknowledgment for the recognition to establish descriptive clinical shoulder range of motion (ROM) measures in a physically active population for musculoskeletal research literature and sports medicine practitioners per appraisal for the level of interest. We recognize that our initial manuscript submission requires various edits per the reviewer’s comments and we’re confident that our associated responses as well as document amendments adequately address these related concerns. We trust to have satisfied all the issues presented by reviewer 2 and propose these modifications have significantly strengthened the quality of our re-submission.

Specific concerns:
Abstract
Form as follows, Background (Purpose), Methods, Results, Conclusions.

We appreciate the reviewer’s attention to formatting. However, we were initially under the impression that we correctly formatted the abstract per SMARTT author instructions specific to the ‘Short Report’ category (i.e. Background, Findings, Conclusions). Thus, we respectfully defer to the section editor as to whether our original abstract format should be amended or not.

Methods
Did authors check past history of sports participation?

Based on institutional research data, approximately 70 % of all incoming first-year students at the military academy participated in various varsity athletics in high school. Furthermore, while at the military academy all cadets are required to participate in various intramural, club or intercollegiate athletics each semester and complete fitness assessments twice a year. A detailed description of the physical activity requirements in the study population has been presented elsewhere (Mountcastle et al. Am J Sports Med, 2007 [6]). We attempted to address this point on page 3, lines 49-54 of the revised manuscript.

While we were unable to document a prior history of sports participation as a variable of interest for this particular cross-sectional analysis even, if we had collected this data the relatively small sample sizes for each individual sport would have likely precluded any meaningful analyses by sport.

How many examiners were included in this study? Who they were? Orthopaedic surgeon, PT, or student?

We appreciate the reviewer’s attention to detail and we respectfully call attention to page 3, lines 55-56 of the initial manuscript version for reference to this inquiry. There were a total of four examiners included in the research study that consisted of sports medicine practitioners with doctoral-level education. However, we are in agreement with the reviewer that perhaps additional descriptive information should be included in the manuscript to highlight the specific professional background profiles for the clinicians recording and presenting these data. Therefore, please find this information added to the updated version of the manuscript on page 3, lines 62-63.

What was about interclass relationship among examiners?

We recognize that inter- and intra-rater reliability are important measurement characteristics to consider in relation to the internal validity of ROM measures. However, due to the large volume of participants that were tested in a relatively short period of time we were unable to assess inter- and intra-rater reliability during this study. This was noted as a limitation in the original manuscript and we have attempted to better clarify this in the revised manuscript (page 8, lines 164-169).
Previous studies (Riddle et al. Phys Ther, 1987 [4]) have demonstrated moderate to good inter- and intra-rater reliability for the specific ROM measures that were assessed as part of this project. To further enhance the consistency in ROM measurement within and between examiners in the current study, all examiners were sports medicine trained practitioners with clinical doctoral-level education. Furthermore all examiners received standardized training in the measurement techniques used from one of the study’s senior investigators prior to the initiation of data collection. All ROM measures were conducted on each individual by the same examiner in a standardized fashion to further reduce measurement error. A previous investigation demonstrated that even relatively inexperienced examiners are able to use goniometers to accurately and precisely measure joint excursions if a standardized method is implemented (Fish & Wingate. Phys Ther, 1985 [7]).

Despite the fact that we were unable to calculate inter-and intra-rater reliability for this particular cross-sectional analysis, and that this is a noted limitation in the manuscript, we believe that this Short Report represents a clinically important contribution to the musculoskeletal literature that will benefit sports medicine practitioners by establishing descriptive values of shoulder ROM measures in a healthy, young, and physically active population for which there is limited information of this nature.

Table 2,3
Describe real p value, not 0.000.

We would like to thank reviewer 2 for bringing this to our attention. Per the reviewer’s recommendation, we have rounded P-values to the nearest thousandth place past the decimal point. Therefore, P-values < 0.001 and originally expressed as 0.000 are now displayed as <0.001. We trust this correction satisfies this important particular point.