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| **Additional file 2: Quality appraisal (part 1)** |
|  | Aboufazeli et al. 2018[39] | Arab et al. 2010[4] | Cai et al. 2015[23] | Cooper et al. 2016[16] | Embaby et al. 2013[24] | Farahpour et al. 2018[17] | Farasyn et al. 2005[35] | Hides et al. 2016[25] | Hungerford et al. 2003[26] | Iglesias-Gonzalez et al. 2013[27] | Kendall et al. 2010[5]  | Larsen et al. 2018[38] |
| 1. Did the study address a clearly focused issue? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| 2. Did the authors use an appropriate method to answer their questions? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| 3. Were the cases recruited in an acceptable way? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes  | Yes | Yes | Yes |
| 4. Were the controls selected in an acceptable way? | Yes | Yes | Yes | Yes | Can’t tell | Yes | Can’t Tell  | Yes | Yes  | Yes | Can’t tell | Yes |
| 5. Was the exposure accurately measured to minimise bias? | Yes | No | Yes  | Can’t tell | Yes | Yes | Yes | Yes  | Yes  | Yes  | Yes | Yes |
| 6 (a). What confounding factors have the authors accounted for? | Age, height, weight, & BMI | BMI, ITB tightness, & LBP | Sex & age | Sex & BMI  | Age, weight, & height  | Age, BMI, & foot posture  | BMI & ODI | Muscle size & strength  | Age, sex, & height  | Age & sex  | Age & sex | Age, BMI |
| 6 (b). Have the authors taken account of the potential confounding factors in the design and/or in their analysis? | Yes | Yes  | Yes | Yes | Can’t tell | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| 7. What are the results of the study? | Change in gluteus medius thickness during hip abduction smaller in LBP group vs control group | Hip abductor weaker in LBP group vs control group | No difference in hip abductor torque between groups | Reduced hip abductor strength in LBP vs control group | Reduced EMG activity gluteus medius in LBP vs control group | Increased EMG activity in LBP vs control group | Pressure pain threshold reduced in LBP vs controls group | Inverse hip abductor strength between stance & kicking leg in LBP vs Control | No difference in EMG activity between LBP and control groups | Latent TrP more common in LBP vs controls group | Reduced hip abduction strength in LBP vs controls control  | No difference in EMG activity in LBP and control groups |
| 8. How precise are the results?How precise is the estimate of risk? | Can’t tell, *P*=0.025 | Can’t tell, *P*<0.001 | Can’t tell, *P*=0.596 | Can’t tell, *P*<0.001  | Can’t tell, *p*<0.05 | Can’t tell, *p*<0.05 | Can’t tell, *P* <0.001 | Can’t tell, *P* =0.04 | Can’t tell, *P*>0.05 | Can’t tell, *p*<0.001 | Can’t tell, *p*>0.05 | Can’t tell, *p*>0.05 |
| 9. Do you believe the results? | Yes | Yes | Can’t tell | Yes | Yes | Yes  | Yes | No | Yes  | Yes | Yes | Yes |
| 10. Can the results be applied to the local population? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | No  | Yes | Yes | Yes | Yes |
| 11. Do the results of this study fit with other available evidence? | Can’t tell  | Yes | Can’t tell | Yes | Can’t tell | Can’t tell | Can’t tell | Yes | Yes | Yes | Yes | Can’t tell  |

**Additional file 2 (continued): Quality appraisal (part 2)** |
|  | Mendis et al. 2016[37] | Nelson-Wong et al. 2013[6] | Njoo et al. 1994[36] | Notzel et al. 2011[28] | Nourbakhsh et al. 2002[3] | Penney et al. 2014[29] | Rabel et al. 2013[30] | Ringheim et al. 2015[31] | Santos et al. 2013[18] | Skorupska et al. 2016[32] | Sutherlin et al. 2015a[33] | Sutherlin et al. 2015b[34] |
| 1. Did the study address a clearly focused issue? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| 2. Did the authors use an appropriate method to answer their questions? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| 3. Were the cases recruited in an acceptable way? | Yes | Yes | Yes | Can’t Tell | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| 4. Were the controls selected in an acceptable way? | Can’t Tell | Yes  | Can’t tell | Can’t Tell | Yes | Yes | Can’t Tell | Yes  | Yes  | Can’t Tell | Can’t Tell | Can’t Tell |
| 5. Was the exposure accurately measured to minimise bias? | Yes  | Can’t Tell | No | Can’t Tell | Can’t Tell | Yes | Can’t Tell | Yes | Can’t Tell | Yes | Yes | Yes |
| 6 (a). What confounding factors have the authors accounted for? | Age, weight, height, & sex | Age, sex, & BMI | Can’t tell  | Can’t tell | Age  | Age, weight, & height  | Age  | Can’t tell  | Age, weight, & BMI | Can’t tell  | Can’t tell  | Can’t tell  |
| 6 (b). Have the authors taken account of the potential confounding factors in the design and/or in their analysis? | Yes | Yes | Yes | Can’t tell  | Yes | Yes  | Yes | Can’t Tell  | Can’t Tell | Yes | Yes  | Yes  |
| 7. What are the results of the study? | No comparisons made between groups for gluteus medius | Altered gluteus medius activation for LBP vs control group | Increased TrP in LBP vs control group | Reduced gluteus medius EMG activity in LBP vs controls group | Reduced gluteus medius strength and more EMG activity in LBP vs control group | Reduced hip abduction strength in LBP vs controls group | No difference in gluteus medius EMG activity between LBP and control group | No difference in EMG activity in LBP vs control group  | Reduced EMG activity of gluteus medius in LBP vs controls group | No difference in muscle volume for gluteus medius in LBP vs control group | No difference in hip abduction torque in LBP vs controls group | No difference in EMG activity of gluteus medius in LBP vs controls group |
| 8. How precise are the results?How precise is the estimate of risk? | Can’t tell, *P* <0.02 | Can’t tell *p*<0.05 | Can’t tell *p*<0.05 | Can’t tell *p*<0.05 | Can’t tell *p*<0.05 | Can’t tell *p*<0.05 | Can’t tell *p*=0.115 | Can’t tell *p*>0.05 | Can’t tell *p*<0.007 | Can’t tell *p*>0.05 | Can’t tell *p*>0.05 | Can’t tell *p*>0.05 |
| 9. Do you believe the results? | Yes | Yes | No | Can’t tell | Can’t tell | Yes | Can’t tell | Can’t tell  | Yes | Yes | Yes | Yes |
| 10. Can the results be applied to the local population? | No  | Yes | Yes | Can’t tell  | Yes | Yes | Yes | Yes | Yes | Yes | Yes | No |
| 11. Do the results of this study fit with other available evidence? | Yes | Yes | Yes | Can’t tell | Yes | Can’t tell | Can’t tell | No | Yes | Yes | No | Yes |