**Supplemental Table 1 Review literatures of longitudinal study between testosterone level and grip strength**

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| Date | Author | Study type | Race | case | variables | finding |
| Our study | Chiu,Hao-Tse | Cross section | Taiwan | 7064 | BMI, Age, CV disease | Testosterone is significant associated with handgrip strength. |
| 2018  | You-Seon Nam | Longitude  | US,EUP | 1002 men |  | TRT does not increase hand grip strength |
| 2018 | Mark D. Peterson | Longitude | US | 2,399 men | Age | elderly men with testosterone deficiency exhibit a significantly higher multimorbidity risk |
| 2018 | Gürlek Demirci B | Longitude | Germany | 144 male kidney transplant recipients |  | Serum testosterone level is correlated with hand-grip strength and C-reactive protein and albumin levels |
| 2011 | TungWai Auyeung | Longitude | Chinese | 1489 elder man(age>65) | BMI, Age | Testosterone level related to both muscle mass, strength and physical performance.  |