

# Lower motor function prior to the Covid-19-imposed lockdown predicts emotional distress in older adults with T2D

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## Abstract

**Background:** Type 2 diabetes (T2D) is associated with accelerated cognitive decline and increased dementia risk. Lockdowns imposed due to the Covid-19 outbreak led to unprecedented changes in the life of older adults. However, little is known about emotional distress consequences. We assessed associations of grey matter (GM) volumes (N=179), cognitive and motor functions (N=403) with emotional distress of older adults with T2D from the Israel Diabetes and Cognitive Decline Study (IDCD).

**Methods:** During the first Covid-19-related lockdown in Israel, we applied a phone questionnaire, which included information about anxiety ("Over the last two weeks, how much have you been bothered by Feeling anxious or nervous?"; Anxiety levels now compared to before Covid-19), depression ("Over the last two weeks, how much have you been bothered by feeling sad, down, or uninterested in life?"; sad feelings now compared to before Covid-19), general well-being ("How are you feeling in general?"), optimism towards the future ("Are you optimistic towards the future?"). Grey matter (GM) volumes (measured by high resolution T1-weighted MRI), cognitive (a global measure summarizing 14 cognitive tests) and motor function (gait speed and grip strength), are routinely assessed by the IDCD study. Spearman correlation adjusting for age, sex, education, HbA1c and duration of T2D (as well as TICV for the GM analyses) examined associations of GM, cognitive and motor functions with emotional distress measures.

**Results:** The sample averaged 72 years of age (SD=4.4), and 14 years of education (SD=3.5); 40.9% were female. Lower grip strength prior to lockdown was associated with increased sadness ( $r=-0.21$ ,  $p<0.001$ ) and anxiety ( $r=-0.11$ ,  $p=0.020$ ), less optimism ( $r=0.10$ ,  $p=0.042$ ) and lower general feeling ( $r=0.17$ ,  $p=0.0005$ ). Slower gait speed was associated with increased sadness ( $r=0.13$ ,  $p=0.005$ ). Lower GM was associated with greater anxiety during the lockdown ( $r=-0.19$ ,  $p=0.011$ ) and compared to before Covid-19 ( $r=-0.19$ ,  $p=0.012$ ). Global cognition was not associated with any of the emotional distress measures.

**Conclusions:** Motor function, but not cognitive function, were associated with lockdown imposed emotional distress in older adults with T2D. These associations point to the importance of good motor function and physical conditioning in emotional well-being related to acute stress related to stay-at-home-orders.