**The association of physical function and physical activity with all-cause mortality and adverse clinical outcomes in non-dialysis chronic kidney disease** **and renal transplant recipients: a systematic review**

**Objective**: People with non-dialysis chronic kidney disease (CKD) and renal transplant recipients (RTRs) have compromised physical function and reduced physical activity levels, which may be associated with poorer clinical outcomes. This trend has been seen in healthy older adults and in other chronic diseases, but remains underexplored in non-dialysis CKD. Identification, and improvements, of these two key ‘modifiable’ lifestyle factors may reduce mortality and clinical adverse events in patients with CKD.

**Data sources:** We performed a systematic review of electronic databases (PubMed, MEDLINE, EMBASE, Web of Science, and the Cochrane Central Register of Controlled Trials) for cohort studies reporting objective and subjective measures of physical activity and physical function, and their independent association with all-cause mortality and adverse clinical outcomes for patients with non-dialysis CKD stages 1 to 5 and RTRs. Databases were searched to December 2017.

**Review methods:** Study quality was assessed using the Newcastle-Ottawa Scale and the Agency for Healthcare and Research Quality standards (AHRQ).

**Results**: 29 studies were identified; 12 reporting on physical function and 17 on physical activity. Only 10 studies were conducted with RTRs. Although not appropriate for meta-analysis due to variance in the outcome measures reported, a coherent pattern was seen with higher mortality rates and/or prevalence of adverse clinical events associated with lower physical activity and poorer physical function levels, irrespective of the measurement or assessment tool used. The majority of trials were classified as “Good” according to the AHRQ standards. Sources of bias included incomplete description of participant flow through the study and over-reliance on self-reported and subjective measures.

**Conclusions**: In non-dialysis CKD and RTRs, better survival rates correlate with greater physical activity and physical function levels. Further trials are required to investigate causality and the effectiveness of physical function/physical activity interventions in improving clinical outcomes. Future work should identify standardised assessment protocols for physical activity and physical function to ensure comparable outcomes in research and clinical practice.