TITLE: Sleep quality and back pain: same genes?

FULL AUTHOR LIST: Madrid-Valero, J.J\textsuperscript{1}, Andreucci, A\textsuperscript{2}, Carrillo-Verdejo, E\textsuperscript{3}, Ferreira, PH\textsuperscript{4}, Martínez-Selva, J.M\textsuperscript{3} and Ordoñana, J.R\textsuperscript{3}.

AFFILIATIONS: 1Department of Health Psychology, University of Alicante, Alicante, Spain. 
\textsuperscript{2}Department of Clinical Medicine, Aalborg University, Aalborg, Denmark 
\textsuperscript{3}Department of Human Anatomy and Psychobiology, University of Murcia, Murcia, Spain 
\textsuperscript{4}Discipline of Physiotherapy, Faculty of Health Sciences, The University of Sydney, Sydney, Australia

KEYWORDS: Low back pain, Neck Pain, Sleep quality.

ABSTRACT: Sleep quality (SQ), chronic Low Back Pain (LBP) and chronic Neck Pain (NP) are genetically influenced; all three conditions frequently co-occur; and shared genetic etiology on a pairwise base has been reported. However, to our knowledge no study has investigated if these three conditions are influenced by the same genetic and environmental factors and the extent and pattern of genetic overlap between them yet. The sample comprised 2134 participants of the Murcia Twin Registry with a mean age of 53.77(SD=7.2). The sample was 54.6\% female. SQ was measured by means of the Pittsburgh Sleep Quality Index Questionnaire. Lifetime prevalence of both NP and LBP were assessed through a dichotomous self-reported question derived from the Spanish National Health Survey. A multivariate model and a common pathway model with two latent factors were fitted in order to estimate the proportion of the variance accounted for: 1) specific genetic and environmental factors on LBP and NP separately; 2) genetic and
environmental factors on a latent factor for back pain (encompassing LBP and NP); and
3) common genetic and environmental factors shared by SQ and the latent back pain
factor. Variance of the latent back pain factor is explained by both genetic (41%) and
environmental (59%) factors. These results also showed that genes affecting SQ only
contribute with a 3% of the variance to the common latent back pain variable and only
5% of the variance on the latent pain factor is shared with environmental factors related
to SQ.

GRANT SUPPORT: Funding: Ministerio de Ciencia, Innovación y Universidades - Spain
(RTI2018-095185-B-I00) co-funded by European Regional Development Fund (FEDER)