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A Biometric Investigation of Leisure-Time Activities Across IGEMS Studies with a Focus on Moderation by Sex, Age, and Country

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The graying of the developed world has motivated researchers to focus not only on the quantity but also the quality of late life. Multiple lifestyle and psycho-behavioral factors are thought to promote a long, healthy, and successful life. Most prominent among these is maintaining an active lifestyle, physically, socially as well as intellectually. Yet, the observation that an active lifestyle is associated with successful aging is causally ambiguous and relatively little is known about the individual-level factors that contribute to an active lifestyle. The Interplay of Genes and Environment across Multiple Studies (IGEMS) consortium is uniquely positioned to address some of these unanswered questions. We investigated genetic and environmental contributions to individual differences in leisure-time activities, measured as the frequency of participating in social, physical, and intellectual activities. We also investigated whether the magnitude of genetic and environmental effects was moderated by sex, age, and country. For this we used the comprehensive data available across studies included in the IGEMS consortium. Data were available on 31,555 like-sex twins (44.0% monozygotic, 31.3% women, age range 32–99 years) representing 11 studies from Sweden, Denmark, USA, and Australia. Results suggest a moderate contribution of genetic factors, with the heritability (estimated as the weighted average across studies) ranging from 34% for social leisure-time activities to 42% for intellectual leisure-time activities, no contribution of common environment, indications of moderation of the heritability of social leisure-time activities by sex with higher heritability in females than in males, and no moderation by age and country.

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Challenges and Opportunities for Twin Research in Nigeria

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Sub-Saharan Africa is under-represented in genetic research globally. The challenges include the high costs of collecting genomic samples (e.g., saliva) including storage, DNA extraction and processing, and the statistical expertise. An alternative strategy is the classical twin design and its other extensions. The high rates of twinning in African countries like Nigeria which is the most populated country in the region can make twin studies a cheaper alternative for genetic research in the region. Academics in the region are keen on innovation and learning new strategies. Potential challenges include an unstable socio-political environment and conflicts. Mental health stigma may create a barrier to investigate mental health-related phenotypes. Low awareness of genetics may mean potential participants do not understand the relevance of genetics to their daily lives. These challenges may be overcome by working in less volatile regions like south-west Nigeria; carrying out campaigns to destigmatise mental health and increase the awareness of genetics; and fostering collaborations with researchers in Nigeria. Preliminary public engagement activities indicate partnering with established health institutions as a means of increasing trust and public participation. Further studies can investigate optimal recruitment strategies for twin studies in low- and middle-income settings.

Association Between Internalising Mental Health Problems and Physical Health: Indirect Effects Through Health Behaviours and Confounding by Correlated Aetiological Influences

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Internalising problems (depressive and anxiety symptoms) are associated with poor physical health indices but confounding by shared genetic and environmental factors has not been previously investigated. We tested whether poor physical health behaviours (poor dietary habits and physical inactivity) and poor sleep quality mediated the associations between internalising problems and physical health indices (BMI and self-rated physical health); and whether these mediated relationships were confounded by genetic and environmental correlations. The sample comprised participants of participants in the UK Twins Early Development Study cohort at ≈22 years. They were assessed for internalising problems, health behaviours, sleep quality, BMI and self-rated health. We specified two phenotypic mediation models with BMI and self-rated health as separate outcomes and investigated genetic and environmental confounding by comparing three twin genetic models. Finally, in the best genetic models, we tested differences by sex, socioeconomic status and high versus normal BMI. Phenotypic associations between