A Bidirectional Relationship between Physical Activity and Quality of Life

Changwook Kim, University of Florida
Kyriaki Kaplanidou (Advisor), University of Florida

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Previous social-ecological studies have developed evidence that physical activity plays an important role in improving quality of life (QoL) (Galloway, 2006). According to the social-ecological model, intrapersonal, interpersonal, and physical environments influence the relationship between physical activity and QoL (Sallis et al., 2006). Previous research has mainly focused only on the effect of physical activity on QoL (Forrest & McHale, 2009). However, a direct causal mechanism in the link between physical activity and QoL has been difficult to prove due to the varying factors, which influence QoL such as social-ecological environments (Ruseski et al., 2014). Interestingly, the social-ecological factors can also affect physical activity (Lee & Park, 2010). Thus, this study investigated whether the relationship between physical activity and QoL can be bidirectional; and whether QoL will increase the participation rates of physical activity. Based on the social-ecological framework, we expected that the interactions among social-ecological variables would affect the relationship between physical activity and QoL (Mcteer & Curtis, 1993).

Given that spatial heterogeneity can potentially account for variations in regional patterns attributed to social-ecological factors (Yang & Timothy, 2014), the analyses of the link between physical activity and QoL should consider the regional disparities in social-ecological environments among communities, through a macro-level analysis (Sato et al., 2016). A total of 67 counties in Florida were chosen as the units of analysis for county-based health services provided by the U.S. local health departments (NACCHO, 2015). The rate of physical activity, social-ecological variables (e.g., intrapersonal, interpersonal, and physical environments), and QoL were acquired from the Behavior Risk Factors Surveillance System (BRFSS) survey and the County Health Ranking (CHR) database.

To investigate the relationship between physical activity and QoL, multi-level random coefficient analyses were employed in three different methods: multi-level model (cross-sectional relationship), fixed effects regression excluding confounders (e.g., time-invariant variables: gender, age, etc.), and a longitudinal multi-level model (from 2010 to 2016). The first multi-level model showed that higher levels of physical activity were associated with better QoL (β = .17, p < .001). Fixed effects regression showed that changes in QoL corresponded with changes in physical activity (β = .07, p < .001). In longitudinal models, low QoL led to subsequent declines in physical activity over time (β = .05, p < .001). In the opposite direction, high levels of physical activity predicted a longitudinal increase in QoL (β = .07, p < .001).

In this study, we found that the relationship between QoL and physical activity can be achieved in mutually beneficial and reciprocal way. The findings of this study suggest changes in physical activity are likely to promote QoL over time and changes in QoL will likely enhance future physical activity. Given the correlation between these two variables, sport policymakers can create relevant intervention strategies in physical-activity policies. Future studies should consider the spatial patterns of the bidirectional relationship between sport and community domains using GIS.