P8158 Final Project
Investigating the Effect of Athletic Identity on Overall Well-Being during COVID-19

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Introduction

The onset of COVID-19 affected almost every sphere of work and leisure. Certain industries and the people in them were affected by the pandemic in interesting ways, as they exist between both work and leisure. In this project, we focused in on one of these industries, athletics, to investigate how one's athletic identity may have impacted their overall well-being, as one's experience of playing a sport and being an athlete may have undergone dramatic changes over the past few years.

Dataset

The dataset we selected contains demographic information and responses for five surveys for athletes and non-athletes in the UK. This data was collected after the country's first COVID-19 lockdown. In total, 753 individuals were interviewed – we will focus our analysis on the 363 athletes represented in this study (reserving the 390 non-athletes for a comparison analysis).

- Athletic Identity Scale (AIMS)
- The Brief Resilience Scale (BRS)
- Mental Health Continuum Short Form (MHC-SF)

Variables of Interest

Latent:

- Athletic Identity
- Resilience (potential mediator)

The second latent variable we were interested in exploring is resilience and the scale we applied to measure it is the Brief Resilience Scale. It includes 6 items in total and each item is measured on a 5-point Likert scale, with 1 representing strongly disagree and 5 representing strongly agree. To ensure consistency, some of the items are reverse coded because they are negatively phrased, for example, brs2, 4, and 6. Also, we renamed each item just for coding convenience.

- Healthy Lifestyle (potential mediator)

We hypothesized that we could create a latent variable representing a healthy lifestyle using the following variables: the categorical variable five fruit and vegetables indicates whether the subject has eaten enough fruit and vegetables. The continuous variable smoking status is measured on a 7-point scale, where 1 represents never, and 7 represents consuming more than 21 cigarettes per day. The hour sleep is a numeric variable indicating how long the subject sleeps per day.

Observed Outcome:

- MHC-SF Sum Score

The outcome variable is derived from the Mental Health Continuum Short Form (MHC-SF), which is basically a scale measuring the overall well-being. This form contains 14 items. The frequency of each item was measured and the response was coded from 0 to 5, with 0 representing never and 5 representing every day. Three components of well-being are assessed, emotional, social, and psychological well-being. For this study, we used the MHC-SF composite score, which is the sum of all responses, as our outcome variable, and its range is from 0 to 70. Higher scores indicate greater levels of positive well-being.

Methdology

1. Conduct PCA to estimate number of components (n) underlying observed variables.

2. Run EFA models on n and $n\pm 1$ components, compare fit statistics and interpretability to select structure to move forward with.
3. Perform CFA to evaluate fit of latent structure.
4. Evaluate reliability of the determined latent variables with Chronbach's alpha.
5. Construct SEM(s) to quantify the relationship between our constructed latent variables and mental health score.

Results

- Resilience

The scree plot indicates that one underlying factor is sufficient to explain the variability across all variables, but we also conducted an exploratory factor analysis for verification. After running exploratory factor analysis on 1 and 2 factor models separately, we discovered that the 1-factor model, which contains all items from the Brief Resilience Scale, fits better. We also assessed the internal consistency of resilience using Cronbach's alpha. An alpha value of 0.89 indicates that the overall internal consistency is good, and the result of deleted alpha test suggests that we should keep all variables because Cronbach's alpha won't be improved if we drop any of the variable. Finally, we conducted a confirmatory factor analysis to examine the model we built. Since the CFI is greater than 0.98, RMSEA is less than 0.08, and the factor loadings are all significant, the overall fit of the model is good.

- Healthy Lifestyle (potential mediator)

Figure xx shows that the Chronbach's alpha is very low (-0.26), indicating that the variables hr_sleep, smoking, fruit_veg might not reliably measure the latent variable healthy_lifestyle, so we made the decision to exclude it from the structural equation modeling analysis.

Effect of Athletic Identity and Overall Well-being

The regression path diagram was constructed to explore correlation between athletic identity and overall well-being (Figure ?). The result revealed that the correlation between aspect of athletic identity and overall well-being is negative (z = -1.20, std.error = 1.66, p = 0.23).

Mediation Effect of Resilience on Correlation between Athletic Identity and Overall Well-being

Path analysis of mediation of resilience was shown in Figure(?). The correlation between athletic identity and overall well-being was -0.028 (z = -0.44, std.error = 1.53, p = 0.658). There was a negative correlation between athletic identity and resilience (z = -1.93, std.error = 0.094, p = 0.054). Resilience had significant correlation with overall well-being. Resilience had significant relationship with overall well-being, which indicated that stronger resilience leaded to better overall well-being (z = 6.69, std.error = 1.14, p<0.05). The standardized indirect effect from athletic identity to overall well-being was -0.056 (z = -1.88, std.error = 0.73, p = 0.061), which was not significant at 0.05 significant level. The estimated direct effect from athletic identity to overall well-being was -0.084 (z = -1.23, std.error = 1.67, p = 0.218). The result showed that the resilience did not mediate the effect of athletic identity on overall well-being. But the correlation between resilience and overall well-being was significant at 0.05 significant level.

Comparison of Mediation Effect of Resilience in Athletes and Non-Athletes

A series of regressions was conducted to test if there are differences in the effects of athletic identity, resilience, and overall well-being between athletes and non-athletes. The correlation between athletic identity and overall well-being was stronger among non-athletes and athletes. The coefficient between athletic identity and overall well-being was -1.657 (z = -2.12, std.error = 0.780, p = 0.034), which indicated stronger athletic identity leaded to worse overall well-being. Resilience had significant correlation with overall well-being for both athletes and non-athletes (z = 1.68, std.error=1.05, p <0.05). The estimated indirect and direct effect of athletic identity on overall well-being are not significant for both athletes and non-athletes. The result indicated that mediation effect of resilience in both groups are not significant at 0.05 significant level.

Conclusion

Discussion

Given the context of this survey, a lack of access to one's sport is a possible explanation for the negative effect athletic identity seems to have produced on overall well-being.

The differences in direct effects between athletic identity and overall well-being between athletes and non-athletes is difficult to account for. Perhaps one possible explanation for the well-being of non-athletes being affected far more than the well-being of athletes by one's reported athletic identity is that though COVID-19 made playing a sport different/difficult universally, athletes may have had more resources at their disposal (i.e., support from coaches, other athletic professionals, etc.)

Our findings for resilience as a trait that is positively associated with mental health and overall well-being agrees with previous research.

Limitations and Recommendations for Further Study

The results of this study should be applied with caution – while making efforts to bolster one's resilience may be something to consider, some exercises to do so may be dangerous.

More variables may exist between the causal pathways we have defined (between athletic identity and overall well-being and perhaps even between athletic identity and resilience).

Treating the `healthy_lifestyle` latent variable as a formative (rather than a reflective) construct might more accurately reflect its nature and allow this construct to be used in SEM.

Demographic characteristics, such as sex, age group, and type of sport, are recommended to be included in future analysis.

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Appendix