Aufgabenblatt 5: Korrelierte Daten II

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Stand: 2022-01-28 21:14 Uhr

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Lesen Sie bitte das Paper von Watts et al. und beantworten Sie die folgenden Fragen:

# Aufgabe I

**1) In der Studie sind gemischte Modelle zur Analyse der Daten eingesetzt worden. Welche Variable ist vermutlich als random intercept modelliert worden? (1 Punkt)**

Neighbourhood

Random-intercept linear regression models were used to examine associations between individual-level and neighbourhood-level independent variables and the sedentary time outcome. So that the neighbourhood should be regarded as the random effect, random-intercept linear regression models mean, it allows different intercept for different neighbourhood

# Aufgabe II

**2) Geben Sie alle linearen Prädiktoren von Tabelle IV vollständig an. Setzen Sie in einem zweiten Schritt die geschätzten Koeffizienten in die Gleichung ein. (4 Punkte)**

## Fully adjusted model without interaction termsa

Abbreviation

* ST: sitting time
* Etc: ethnicity
* JC: job category
* HS: hope scale
* MP: mobility problems
* UPC: problems with usual activities and physical activity
* SNC: social networks scale

## Fully adjusted model without interaction terms (Subgroup analyses)

## Fully adjusted model with interaction terms

# Aufgabe III

**3) In den Limitationen der Studie wurden „multiple comparisons“ problematisiert. Beschreiben Sie das Problem und dessen Auswirkungen. Wie könnte man hier abhelfen? (5 Punkte)**

From paper

It should also be noted that with multiple comparisons of variables there is increased likelihood of type I errors (incorrectly reporting significant relationships) as these relationships may have been observed by chance (Feise, 2002).

The first thing to note is that the problem of multiplicity only arises if there are multiple primary endpoints, i.e. all of the primary endpoints are performed in a confirmed manner. The problem with all statistical tests is the fact that the (overall) error rate increases with increasing number of tests.

So the first solution is to adjust the study design.

* On the one hand, one primary endpoint can be chosen and the other endpoints are performed in an exploratory manner, which avoids multiplicity issues
* On the other hand, where all endpoints have been analyzed in a confirmatory manner, a horizontal test design can be chosen, ranking the endpoints to maintain type 1 error

The second solution is to adjust the type 1 error, and there are different methods

* Bonferroni Methods
* Šidák Methods
* Or using Closed and Stepwise Testing Methods