

A cross sectional analysis of influencing factors on misperception in self-reported physical activity

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Background

Self-report questionnaires are often used to assess physical activity in large populations in a cost-efficient way. Researchers use them to screen population's physical activity levels and evaluate the efficacy of physical activity interventions. However, misperception of one's own physical activity level is a recurrent problem in rehabilitation and health promotion [1-2].

The present study aims to determine

- (1) the closeness of agreement between self-reported and objective measure of physical activity;
- (2) influencing factors on over- and underestimation of physical activity and sedentary behavior;
- (3) differences in self-estimation between low back pain (LBP) patients and healthy controls.

Methods

27 LBP patients and 53 healthy vocational school students (controls) wore a triaxial accelerometer (Actigraph GT3X+; AG) during waking hours on seven consecutive days and answered a questionnaire (GPAQ) on physical activity over the same period of time (Figure 1). Bland-Altman analysis was performed for describing the closeness of agreement of the assessment methods. Influence of age, sex and body mass index on misperception of physical activity and sedentary behavior was examined with multiple linear regression. Mann-Whitney U tests were used for detection of group differences.



Figure 1: Application of the Actigraph GT3X+ and the Questionnaire (GPAQ)

Results

Table 1: Study sample characteristics and mean differences (GPAQ-AG) for moderate and vigorous physical activity and sedentary behavior.

	Age [years], mean (SD)	Sex [male], n (%)	Body Mass Index [kg/m ²], mean (SD)	Difference moderate PA [min/day], mean (SD)	Difference vigorous PA [min/day], mean (SD)	Difference sedentary behavior [min/day], mean (SD)
Total sample (n=78)	31.4 (15.7)	48 (60.0)	25.9 (5.2)	39.0 (62.1)	42.0 (92.0)	-122.2 (194.0)
LBP Group (n=25)	51.8 (6.9)*	17 (68.0)	29.4 (4.9)*	78.4 (109.6)*	45.8 (78.5)	-248.5 (180.6)*
Controls (n=53)	20.7 (3.1)*	30 (56.6)	24.1 (4.5)*	24.8 (77.7)*	35.9 (53.2)	-62.6 (171.5)*

*statistically significant group difference at significance level $p < 0.05$. PA=Physical activity.

An overview of participants' characteristics can be seen in Table 1. Two LBP-participants were excluded due to missing data.

- (1) Bland-Altman analysis (Figure 2) showed poor agreement of self-reported and objective data with significant overestimation of moderate (42.0 min/day; $p=0.003$) and vigorous physical activity (39.0 min/day; $p<0.001$). Sedentary behavior was significantly underestimated (-122.2 min/day; $p<0.001$).
- (2) No significant influence of age, sex or body mass index on misperception of physical activity and sedentary behavior was detected.
- (3) Group differences were found in the estimation of sedentary behavior ($p<0.001$) and moderate physical activity ($p=0.015$) with significantly bigger misperception in LBP patients (Table 1).

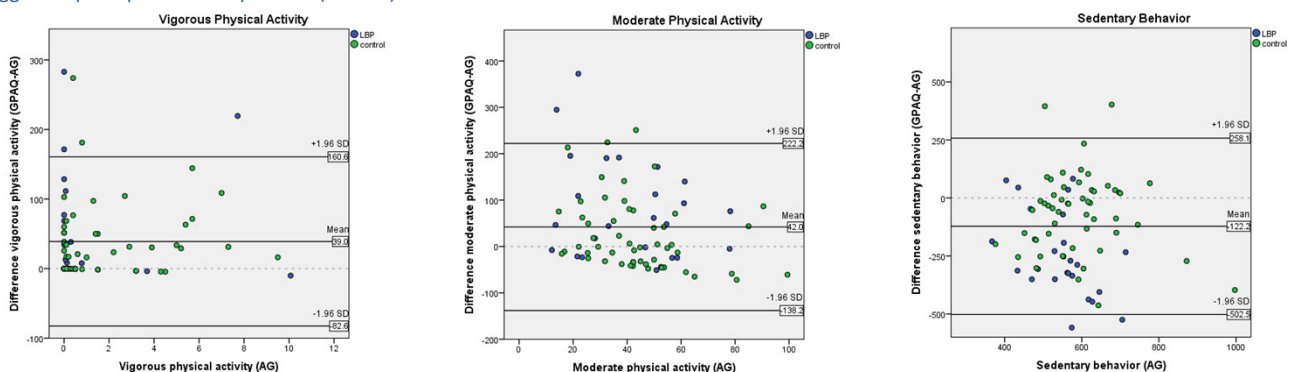


Figure 2: Bland-Altman plots for vigorous and moderate physical activity and sedentary behavior. The mean differences illustrate biases in physical activity estimation.

Conclusion

- Findings based on self-reported physical activity have to be interpreted with caution since significant misperception is present in LBP patients as well as in healthy controls.
- The present results contradict other studies that identified an influence of age, sex and body mass index on the overestimation of physical activity [1].
- Further research on influencing factors is needed to identify possible strategies to overcome the problems associated with misperception in self-reports. Moreover, the causality between bigger misperception and LBP needs to be examined.

References

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