

DEPRESSION, PHYSICAL ACTIVITY AND OBESITY AMONG OLDER WOMEN – THE MECHANISM OF RELATIONSHIPS

Aleksandra Kroemeke¹, Izabela Zajac-Gawlak², Dariusz Pośpiech², Aleš Gába³, Miroslava Přidalová³

¹University of Social Sciences and Humanities (Poland), ²The Jerzy Kukuczka Academy of Physical Education (Poland), ³Palacky University Olomouc (Czech Republic)

Introduction

Important public health problems in older adults: depression and obesity (mainly abdominal obesity), especially in females.

Overweight and obesity are usually associated with a low level of **physical activity**, as well as a higher level of **depression** (e.g., Zhao et al., 2011). There is good evidence that obesity is prospectively associated with increased depression, along with less consistent evidence that depression leads to obesity (Faith et al., 2011). Health behaviors could mediate and a degree of obesity may moderate these associations (Onyike et al., 2003; Faith et al., 2011).

The nature of the **physical activity–depression relationship** is also reciprocal (e.g., Lindwall et al., 2011). A higher level of physical activity is generally related to a lower level of depression (e.g., Lindwall et al., 2007), but the effect of depression on physical activity in older adults was also found (e.g., Patten et al., 2009). Long-term physical activity has a well-documented beneficial effect, e.g., counterbalances the negative impact of **obesity**. However, excessive physical loads may lead to overtraining and overtraining-related psychological symptoms that mimic depression (O'Connor, 2007).

What was tested?

→ search for the mechanism of the relationship between depression, physical activity and obesity among older women.

It was investigated

- (1) whether physical activity mediate the relationship between obesity and depression
- (2) whether this mediation is moderated by the degree of obesity.



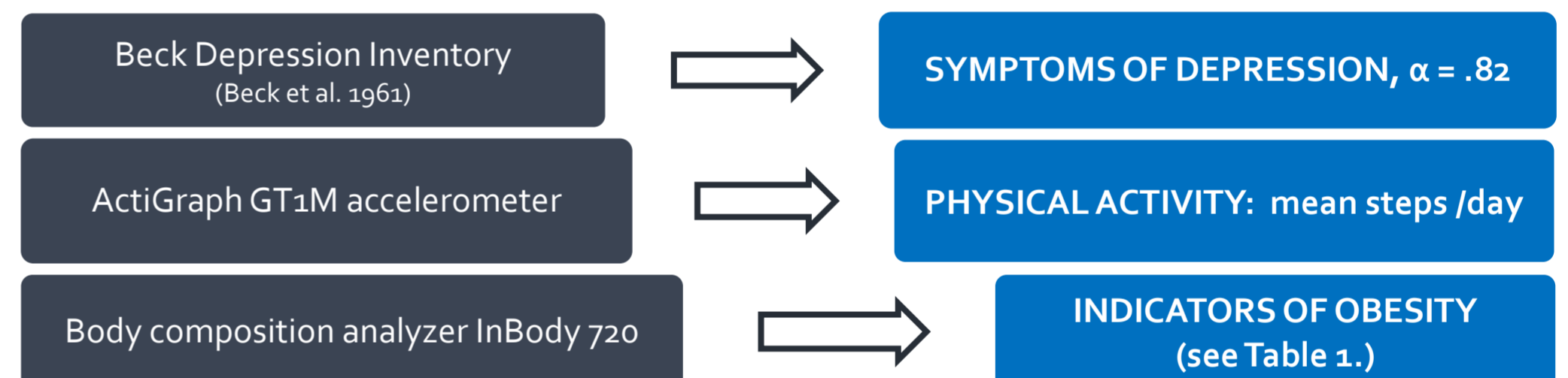
Methods

Participants and procedure

83 healthy women, aged 51 – 81 years ($M = 63.25$; $SD = 5.51$) belonging to the University of Third Age in Poland

Participants were recruited by offering free physical activity (after instructing accelerometer was worn on an elastic belt at the midaxillary line of the right hip during all waking hours except water activities across seven days) and body composition analysis (multi-frequency bioelectrical impedance analysis method).

Measures



Results

Table 1. Descriptive statistics (N = 83).

Variables	<i>M</i>	<i>SD</i>	Min.	Max.	Norm
BDI	6.74	5.33	0	25	< 10
Steps/day	10659	3628,5	3528,3	19 957,9	≥ 10 000
BMI	28.06	4.58	17.88	40,96	18.5 - 25
OD	130.54	21.30	83.10	190.43	90 - 110
PBF	38.44	7.02	14.79	52.51	18 - 28
WHR	.99	.06	.88	1.14	.75 - .85
VFA	142.03	33.74	65.26	228.64	< 87.6

BDI = number of symptoms of depression
Steps/day = mean steps per day per week

Obesity indicators:

BMI = body mass index (kg/m^2); defines obesity, but it cannot provide complex information about the variability of body fat mass
OD = obesity degree; the percentage above or below ideal weight
PBF = percent body fat; the percentage of body fat to body weight

Abdominal obesity indicators:

WHR = waist-hip ratio; the ratio of the circumference of the waist to hips
VFA = visceral fat area (cm^2); absolute waist circumference

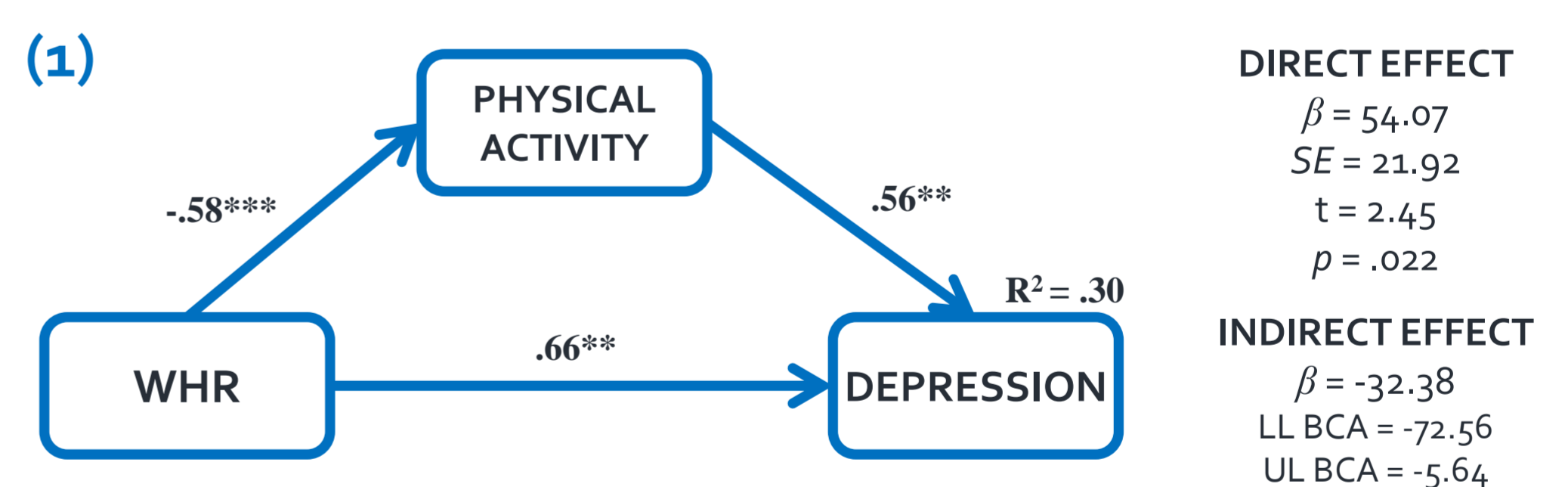


Figure 1. Effect of WHR on depression through physical activity.
** $p < .01$; *** $p < .001$.

(2)

Table 2. Bootstrapped indirect effects of waist-hip ratio on symptoms of depression via steps/day at specific values of the moderator (waist-hip ratio, WHR).

WHR	Effect	<i>SE</i>	LL BCA	UL BCA
- 1 <i>SD</i>	-30.01	19.55	-72.48	2.91
Mean	-34.06	21.72	-85.76	-1.78
+ 1 <i>SD</i>	-38.10	33.39	-108.54	7.25

Note: ** $p < .01$; 5000 bootstrapping resamples; LL BCA and UL BCA = Lower level and Upper level of the bias-corrected and accelerated confidence interval for $\alpha = .05$.

Discussion and conclusions

→ Only waist-hip ratio (WHR) was related to symptoms of depression in women.

→ The relation between **WHR and depression** was partially mediated through **physical activity**: the higher the waist-hip ratio, the lower number of steps per day per week, and in consequence the lower the number of symptoms of depression. Paradoxically, indirect effect was negative.

→ **Physical activity** was positively related to **depression**. The result of overtraining? But...

→ This effect was moderated by the level of abdominal obesity. Mediation was significant only **at the mean levels of WHR**.

→ However, all the obesity factors indicate that the **sample was overweight** with abdominal obesity (the effect of menopause-weight relationship?).