# VEDENJSKE POTEZE AGRESIVNOSTI PRI OSEBAH, IZPOSTAVLJENIH PRENATALNEMU STRESU

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# PRENATALNI STRES

**= stres, ki ga doživlja mama v času nosečnosti in lahko (negativno) učinkuje na razvoj otroka**

- povečano tveganje za kardiovaskularne bolezni, debelost, izkrivljen motorični razvoj, epilepsijo (1)

| | |
|---|---|
| Increased anxiety | O'Connor, Heron, & Glover, 2002; Van Den Bergh & Marcoen, 2004; Bergman et al., 2007; de Bruijn et al., 2009 |
| Increased ADHD<br>*More readily distracted attention*<br>*Increased impulsivity* | O'Connor, Heron, Golding et al., 2002; Obel, Henriksen et al., 2003; Huizink et al., 2002; Rodriguez & Bohlin, 2005; Van Den Bergh & Marcoen, 2004 |
| Increased conduct disorder<br>*Breaking rules*<br>*Increased aggression* | O'Connor, Heron, & Glover, 2002; Van Den Bergh & Marcoen, 2004; de Bruijn et al., 2009; Rice et al., 2010; E. D. Barker & Maughan, 2009 |
| Lower cognitive performance | Bergman et al., 2007; Laplante et al., 2008; Mennes et al., 2006; Huizink et al., 2003) |
| More mixed handedness | Obel, Hedegaard et al., 2003; Glover et al., 2004; Rodriguez & Waldenstrom, 2008 |
| Altered function of the HPA axis | O'Connor et al., 2005; Yehuda et al., 2005; Gutteling et al., 2005; Huizink et al., 2008; Van den Bergh et al., 2008; Entringer, Kumsta et al., 2009 |
| Fewer male offspring | Peterka et al., 2004; Obel et al., 2007 |

(2)

(1) Cottrell in Seckl, 2009
(2) Glover, 2011

# PRENATALNI STRES

- negativni učinki prenatalnega stresa kot **rezultat podaljšane izpostavljenosti fetusa povišanim nivojem kortizola** (3)
  - povečano izločanje kortizola v nosečnosti se povezuje z *nižjo porodno težo, povišanim neonatalnim nivojem kortizola in z dolgotrajnimi učinki na psihološki razvoj* (4)

- **prenatalni stres → trajne spremembe v nevrotransmiterskem sistemu → možna povečana ranljivost za težave v duševnem zdravju**
  - povezave z *razpoloženjskimi motnjami, shizofrenijo, zlorabo psihoaktivnih substanc, vedenjskimi motnjami, motnjami spanja* (5)

(3) npr. Huizink idr., 2003
(4) npr. Bergman idr., 2007; Khashan idr., 2008
(5) Field in Diego, 2008

# PRENATALNI STRES IN AGRESIVNOST

- prenatalni stres potencialno lahko učinkuje na spremembe funkcije HPA osi
  - **spremenjena aktivnost HPA osi + nizki bazalni nivoji kortizola + zmanjšan odziv na stres → potencialni biološki markerji** nekaterih motenj pozunanjenja, še posebej **agresivnosti** (6)
    - vendar: nujno še proučevanje interakcije genetskih, bioloških in socialnih faktorjev za bolj jasno razumevanje povezave med HPA osjo in psihopatologijo (7)

- antisocialno vedenje bolj verjetno pri otrocih mater izpostavljenih povečanemu stresu, anksioznosti ali depresiji v času nosečnosti (8)
  - npr. možno kot **adaptacija fetusa na pričakovane nezaželene oz. škodljive pogoje postnatalnega okolja** (9)

(6) Gowin idr., 2013; Platje idr., 2013; Popma idr., 2007; Poustka idr., 2010
(7) Alink idr., 2008; Buchmann idr., 2014
(8) Hay idr., 2010
(9) Bachmann idr., 2014

# PRENATALNI STRES IN SPOL

**Abstract** An increased incidence of anxiety, depression and attention deficits in children has been linked to psychological stress during pregnancy. Subjection of a pregnant rat to stress at a time when the foetal limbic and hypothalamic pituitary adrenal (HPA) axes develop results in anxiogenic and depressive behaviour and learning and attention deficits in the offspring, which depend on its gender, intensity and timing of the maternal stress and behaviour being tested. Maternal stress increases corticosterone levels in the foetal brain, decreases foetal testosterone and brain aromatase activity in males, and alters brain catecholamine activity to that in females. Learning deficits, reductions in hippocampal neurogenesis, LTP and dendritic spine density in the prefrontal cortex are more readily seen in prenatally-stressed males, while anxiety, depression and increased response of the HPA axis to stress are more prevalent in females. Genders may differ in the sensitivity of developing brain areas to stress hormones.

(10)

A B S T R A C T

*Background:* Sex differences are found in animal studies concerning the relationship between prenatal maternal stress and outcome of the offspring. Most human studies in this field have not addressed sex differences, although differences between boys and girls may elucidate the biochemical as well as psychological processes involved. Associations between prenatal maternal emotional complaints and behavioural problems of toddlers and preschoolers as assessed by both mothers and fathers are studied separately for boys and girls.
*Methods:* Healthy Dutch Caucasian singleton, pregnant women ($N = 444$) answered questionnaires about anxiety and depression in every trimester of pregnancy. When their children (227 boys, 217 girls) were between 14 and 54 months old, both parents reported on their current feelings of depression and anxiety and on the behavioural problems of their children.
*Results:* Prenatal maternal emotional complaints were found to be associated with child behavioural problems both in boys and in girls, but in different ways. Prenatal maternal emotional complaints during the first trimester were associated with total and internalizing behavioural problems for boys. Emotional complaints during the third trimester were associated with total, internalizing, as well as externalizing behavioural problems for girls.
*Conclusions:* Differentiation according to sex and information on timing of emotional complaints during pregnancy is needed in studies concerning the relation between prenatal maternal emotional complaints and child outcome.

(11)

(10) Weinstock, 2007
(11) de Bruijn idr., 2009

# ŠTUDIJE PRENATALNEGA STRESA IN OPREDELITEV STRESNEGA DOGODKA

- možni stresni dogodki za preučevanje prenatalnega stresa: psihološka travma, izguba zaposlitve, smrt parnerja, huda poškodba, izkušnje naravnih katastrof,... (12)
  - nekatere je mogoče tudi bolj objektivno določiti v smislu intenzivnosti in trajanja (npr. potresi, teroristični napadi, vojne) (13)

27. 6. – 7. 7. 1991: 10-dnevna vojna za Slo.

(12) npr. Robinson idr., 2009; Dancause idr., 2011; Harville idr., 2010
(13) Graignic-Philippe idr., 2014

# NAMEN

- preliminarni pregled izraženosti vedenjskih potez agresivnosti pri potomcih mater, izpostavljenih 10-dnevni vojni

  (v primerjavi s potomci mater, nosečih pred in po vojni)

**PSIHOLOŠKE IN REPRODUKTIVNE MOTNJE PRI MOŠKIH, IZPOSTAVLJENIH PRENATALNEMU STRESU**

- psihološka študija
- androloška študija (reproduktivno zdravje moških, izpostavljenih prenatalnemu stresu)
- študija živalskih modelov

# METODA: UDELEŽENCI

3 skupine: prenatalno obdobje glede na 10-dnevno vojno

| | **Vsi** | **Moški** | **Ženske** |
|---|---|---|---|
| Skupina | N (% celotnega N) | N (% skupine) | N (% skupine) |
| Pred vojno (kontrolna skupina 1) [1. 9. 1990 – 31. 3. 1991] | 169 (21,8 %) | 88 (52,1 %) | 81 (47,9 %) |
| Med vojno (nosečnost) * [30. 6. 1991 – 8. 3. 1992] | 284 (36.6 %) | 172 (60,8 %) | 111 (39,2 %) |
| Po vojni (kontrolna skupina 2) ** [1. 4. 1992 – 31. 12. 1992] | 323 (41.6 %) | 208 (65,0 %) | 112 (34,7 %) |
| Skupaj | 776 (100.0 %) | 468 (60.3 %) | 304 (39,2 %) |

* Manjkajoč podatek o spolu za 1 udeleženca.
** Manjkajoč podatek o spolu za 3 udeležence.

# METODA: INSTRUMENTI

**Buss-Perryjev vprašalnik agresivnosti BPAQ** (14)

- fizična agresivnost (9 postavk; $\alpha = 0,71$)
- besedna agresivnost (5 postavk; $\alpha = 0,56$)
- jeza (7 postavk; $\alpha = 0,74$)
- sovraštvo (8 postavk; $\alpha = 0,76$)

+ vprašalnik z demografskimi spremenljivkami

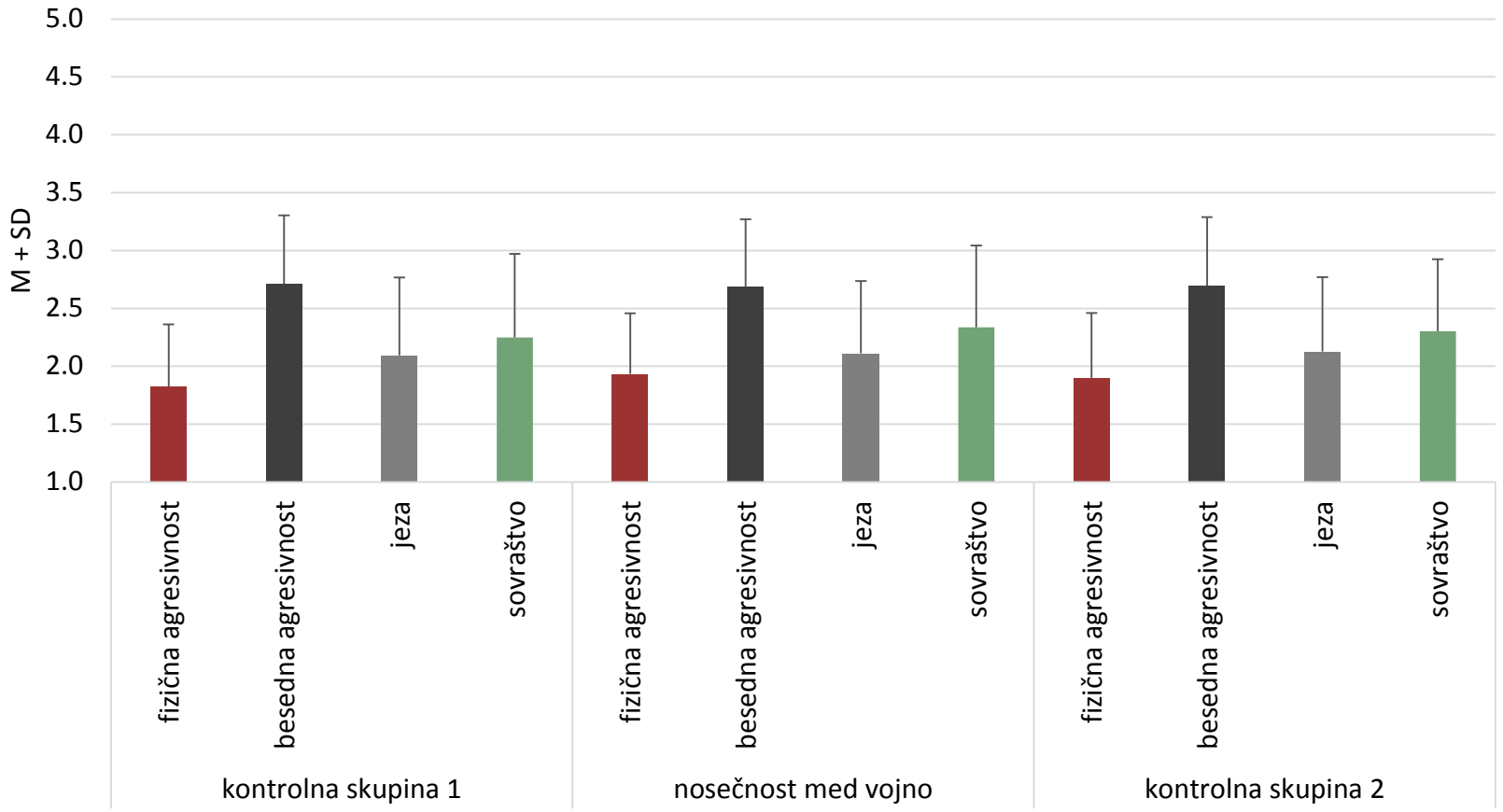
(14) Buss in Perry, 1992

# METODA: POSTOPEK IN STATISTIČNE ANALIZE

- udeleženci iz fakultet UL in UM (od oktobra 2014 do maja 2016)
- pogoj za sodelovanje: podpisano soglasje in datum rojstva od 1.9.1990 do 31.12.1992

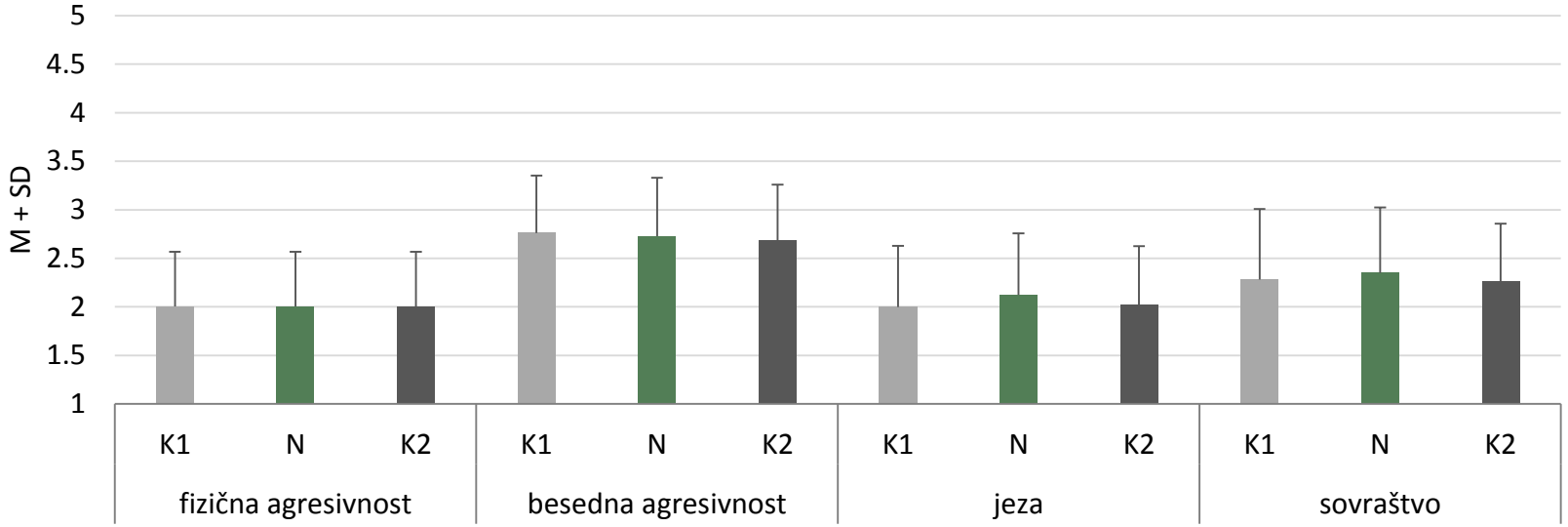
- ANOVA, zankanje

# REZULTATI




*Slika 1.* **Povprečni dosežki skupin na podlestvicah agresivnosti**

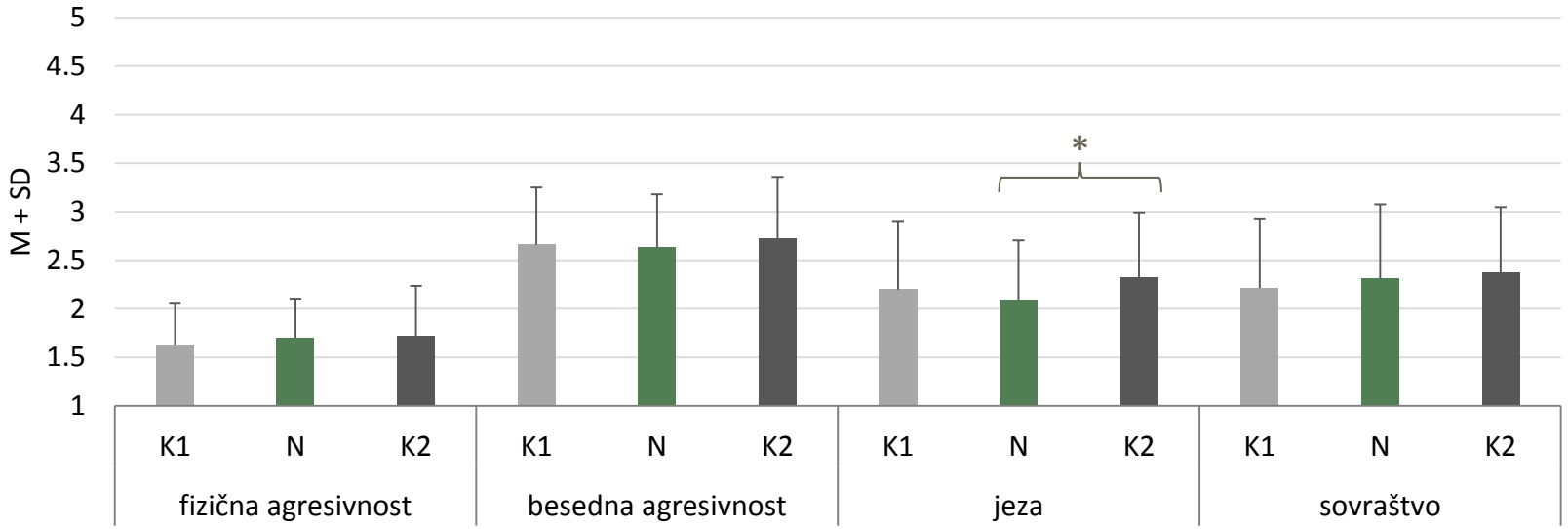
# REZULTATI: MOŠKI




*Slika 2.* **Povprečni dosežki skupin na podlestvicah agresivnosti (moški)**

- fizična agresivnost: F(1,465) = 1,292, $p$ = 0,276, $r$ = 0,074
- besedna agresivnost: F(1,465) = 0,547, $p$ = 0,579, $r$ = 0,048
- jeza: F(1,465) = 1,730, $p$ = 0,178, $r$ = 0,086
- sovraštvo: F(1,465) = 0,830, $p$ = 0,437, $r$ = 0,060

# REZULTATI: ŽENSKE




*Slika 3.* **Povprečni dosežki skupin na podlestvicah agresivnosti (ženske)**

- fizična agresivnost: F(1,301) = 1,006, $p$ = 0,367, $r$ = 0,081
- besedna agresivnost: F(1,301) = 0,810, $p$ = 0,446, $r$ = 0,073
- jeza: F(1,301) = 3,457, $p$ = 0,032, $r$ = 0,150
  - post hoc (Gabrielov postopek): skupina nosečnosti in kontrolna skupina 2, $p$ = 0,027
- sovraštvo: F(1,301) = 1,170, $p$ = 0,312, $r$ = 0,088

# DISKUSIJA

- ni značilnih razlik v izraženosti potez agresivnosti…
- … razen pri ženskah – podlestvica jeze: v skupini nosečnosti med vojno manj izražena kot v skupini po vojni

- fetus ni enako ranljiv za zunanje vplive v vseh treh semestrih
- možni moderatorski učinki genotipa med prenatalnim stresom in agresivnostjo
  - DRD4 alel kot moderator med prenatalnim stresom in agresivnostjo (15)

- je 10-dnevna vojna ustrezen stresor?

- materina percepcija vojne kot stresorja
- možni drugi stresni dogodki med nosečnostjo
- različna izpostavljenost (geografska spremenljivka)

(15) Buchmann idr., 2014

# ZAKLJUČKI

nadaljevanje študije:

- povezava med prenatalnim stresom in ranljivostjo za druge motnje v duševnem zdravju (TEMPS-A, CAD)
- povezovanje podatkov z androloškimi podatki o reproduktivnem zdravju
- analize po trimesečjih nosečnosti za skupino, izpostavljeno stresorju

- pomembno za razumevanje mehanizmov in učinkov prenatalnega stresa na vedenjske poteze → možnost za intervencije za obvladovanje prenatalnega stresa za noseče matere, izpostavljene stresu

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# HVALA ZA VAŠO POZORNOST!

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