Preliminary Studies

- Followed 503 military women, active duty and wives of military members across pregnancy
- Explored impact of prenatal anxiety and family functioning on birth outcomes

Learning Outcomes

At the conclusion of this activity, participants will be able to:

1. Describe the differences in prenatal maternal anxiety and depression for active duty and nonactive duty women.
2. Describe the changes in maternal prenatal anxiety and depression that occur over the course of the pregnancy for women participating in the prenatal support program and those not receiving the program.
3. Summarize the benefits associated with a structured prenatal pregnancy support program, and the connection to improved birth outcomes and the impact on readiness of the warfighter.

Study Methods

- Convenience sample
- Variables assessed in 1st, 2nd, and 3rd trimester
- Measures
  - Prenatal-specific anxiety
  - Family functioning
  - Social support
- **Data collection began in September 2001**

Pregnancy-Specific Anxiety

- Increased anxiety for *Acceptance of pregnancy*, *Identification with a Motherhood Role*, *Preparation for Labor*, & *Well-Being* predicted early gestational age
- Increased anxiety for *Preparation for Labor* and *Fears of Helplessness and Loss of Control in Labor* predicted low birthweight

Family Functioning

- Women's perception of family adaptability had a statistically significant effect on ALL pregnancy-specific anxiety attributes
- Women in families considered to be dysfunctional for adaptability and cohesion were 8 times more likely to experience hyperemesis

Community Support

Esteem –building support

- Significant negative association with prenatal anxiety
- Positive predictive relationship with community support in **1st** and **2nd trimesters to infant birthweight**
- Women identifying an "**on-base**" versus "off-base **community** of reference had **significant decreases in prenatal anxiety**

Deployment of Spouse/Partner

- Military deployment of spouse (father of the baby) in **1st trimester**
  - Statistically significant negative association with maternal acceptance of pregnancy
  - Predicted maternal role satisfaction and maternal-infant attachment at 6 months postpartum
  - Not predictive of maternal competence
  - Mothers had highest scores for symptoms of depression

**Father/Spouse often back home prior to delivery*

Results Guided Intervention Development

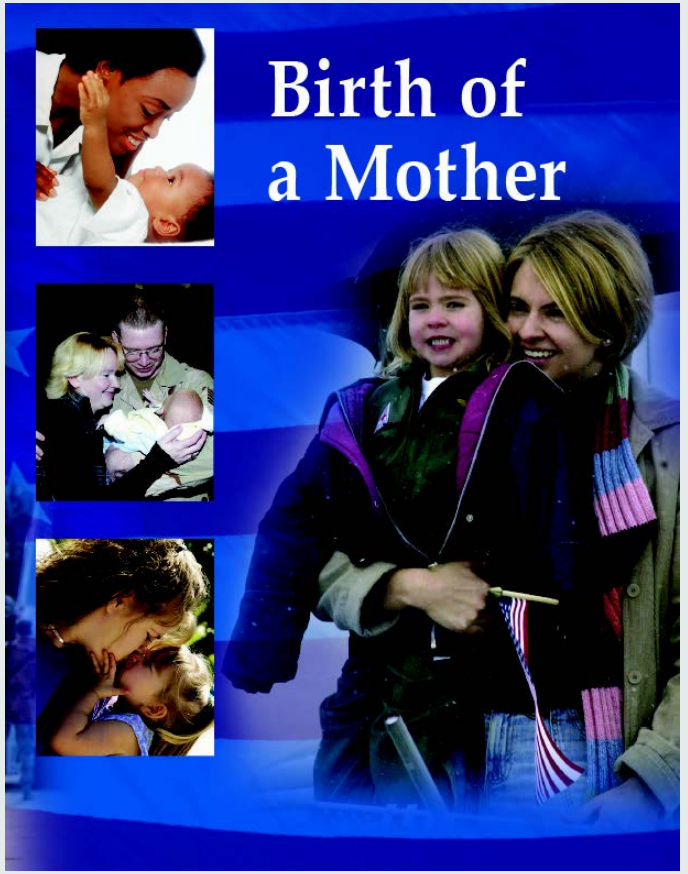
- Timing of intervention – must start in the first trimester
- Support from a military-specific community
- Focused intervention to pregnancy-specific anxiety
- Absence of spouse/father of baby impacts self-esteem

Developing & Piloting an Intervention

Mentors Offering Maternal Support (M-O-M-S)

Mentors Offering Maternal Support (M-O-M-S)

- Begins in 1st trimester
- Each session focused on specific dimensions of pregnancy anxiety
- Mentors guide program and provide support
- Program manual provides discussion points



M-O-M-S Pilot

- 65 mothers in first trimester, randomized to control group (control group, n = 36; intervention group n=29), completed all aspects of study
- All had deployed spouses
- Study conducted at two bases having Special Operations missions and high deployment tempos

M-O-M-S Pilot - Measures

Variable	Measure
Prenatal Maternal Anxiety	*Prenatal Self-Evaluation Questionnaire* – PSEQ , 79 items, 7 scales (Lederman, 1996)
Perceived Community Support	*Social Support Index* – SSI; 17 items (McCubbin, Patterson, & Glynn, 1982)
Maternal Attachment	*Maternal Antenatal Attachment Scale* – MAAS, 19 items (Conden, 1981)
Self-Esteem	*Rosenberg Self-Esteem Questionnaire* – RSE, 10 items (Rosenberg, 1979)

M-O-M-S Pilot Results

- No statistically significant differences found between tx/control groups
- *Women having greatest contact with spouses had higher scores for self-esteem
- High satisfaction with program
- Requested modifications to study manual
- Participation continued after completing the 8 sessions (desired postpartum support)

Randomized Clinical Trial

Mentors Offering Maternal Support (M-O-M-S)

M-O-M-S Randomized Clinical Trial

- Design: Randomized-controlled trial with repeated measures
- Setting: San Antonio military community
- Sample: *n = 367* women in 1st trimester; Complete data across 3 trimesters for *n = 246*
- Measurement:
  Prenatal anxiety, self-esteem, resilience and depression measured in each trimester

Measures

Variable	Measure
Prenatal Maternal Anxiety	*Prenatal Self-Evaluation Questionnaire* – PSEQ – SF, 53 items, 7 scales (Lederman & Weis, 2009)
Self-Esteem	*Rosenberg Self-Esteem Questionnaire* – RSE, 10 items (Rosenberg, 1979)
Resilience	*Brief Resilience Scale – BRS*, 6 items (Smith et al., 2008)
Depression	*Edinburgh Postnatal Depression Scale – EPDS*, 10 items (Murray & Cox, 1990)

Demographics

- Ages 19-42 (*M* = 28.72, *SD* = 5.00)
- White/Caucasion (60%), Black, nonHispanic (29%), Hispanic (22%)
- Married (91%)
- Employed (63%)
- College degree (42%)
- First pregnancy (38%)
- Active duty women (40%)
- Deployed partner during pregnancy (9%)
- Enlisted (73%)
- Air Force (64%), Army (24%), Navy (9%)

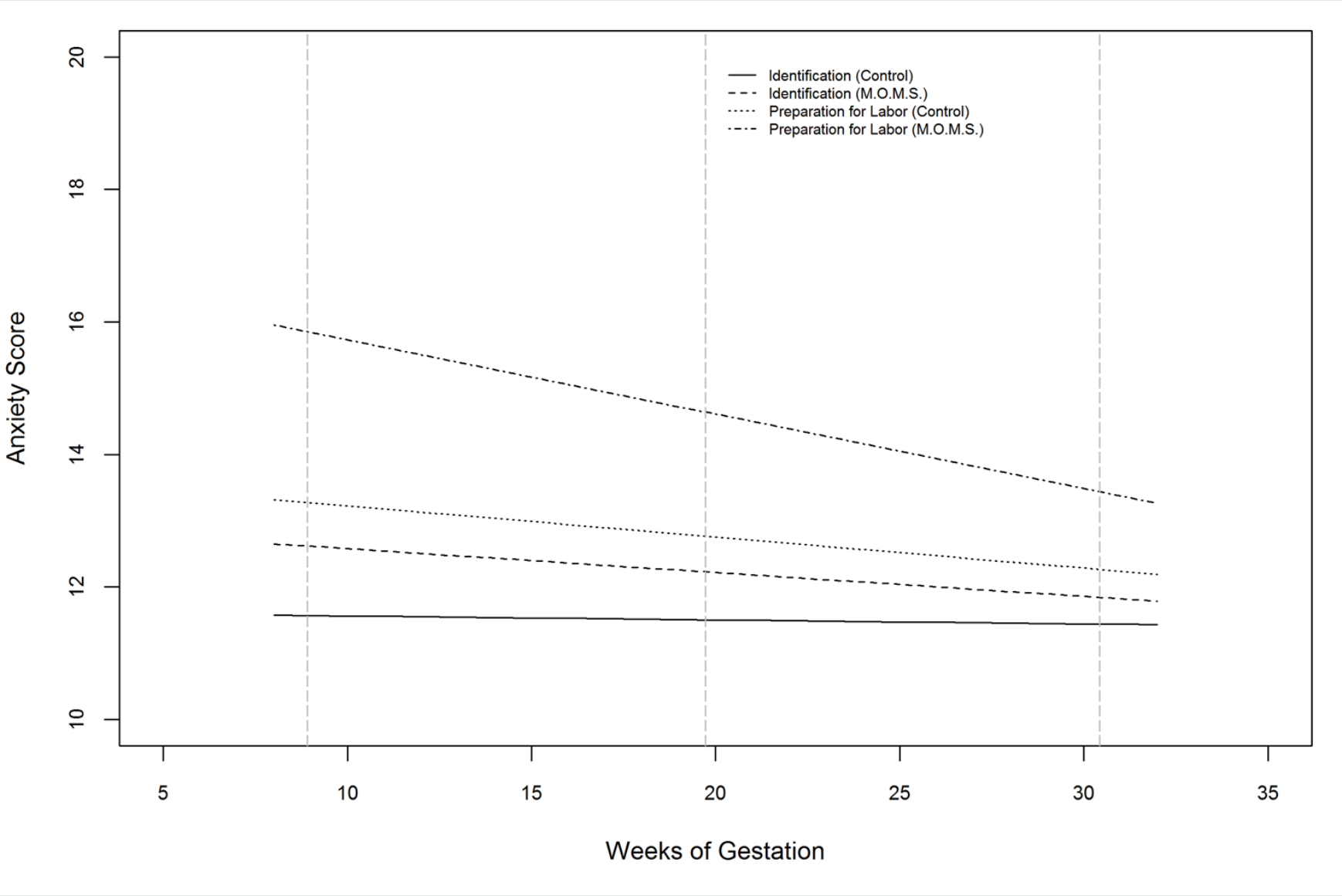
Results

Women in M-O-M-S Intervention had:

- Statistically significant decreases in anxiety related to *Identification with a Motherhood Role (p* = .049*)*

- Statistically significant decreases in anxiety related to *Preparation for Labor (p* = .017*)*

Identification & Preparation for Labor



Prenatal Anxiety

Identification with a Motherhood Role

Deployment was a significant predictor of anxiety related to Identification

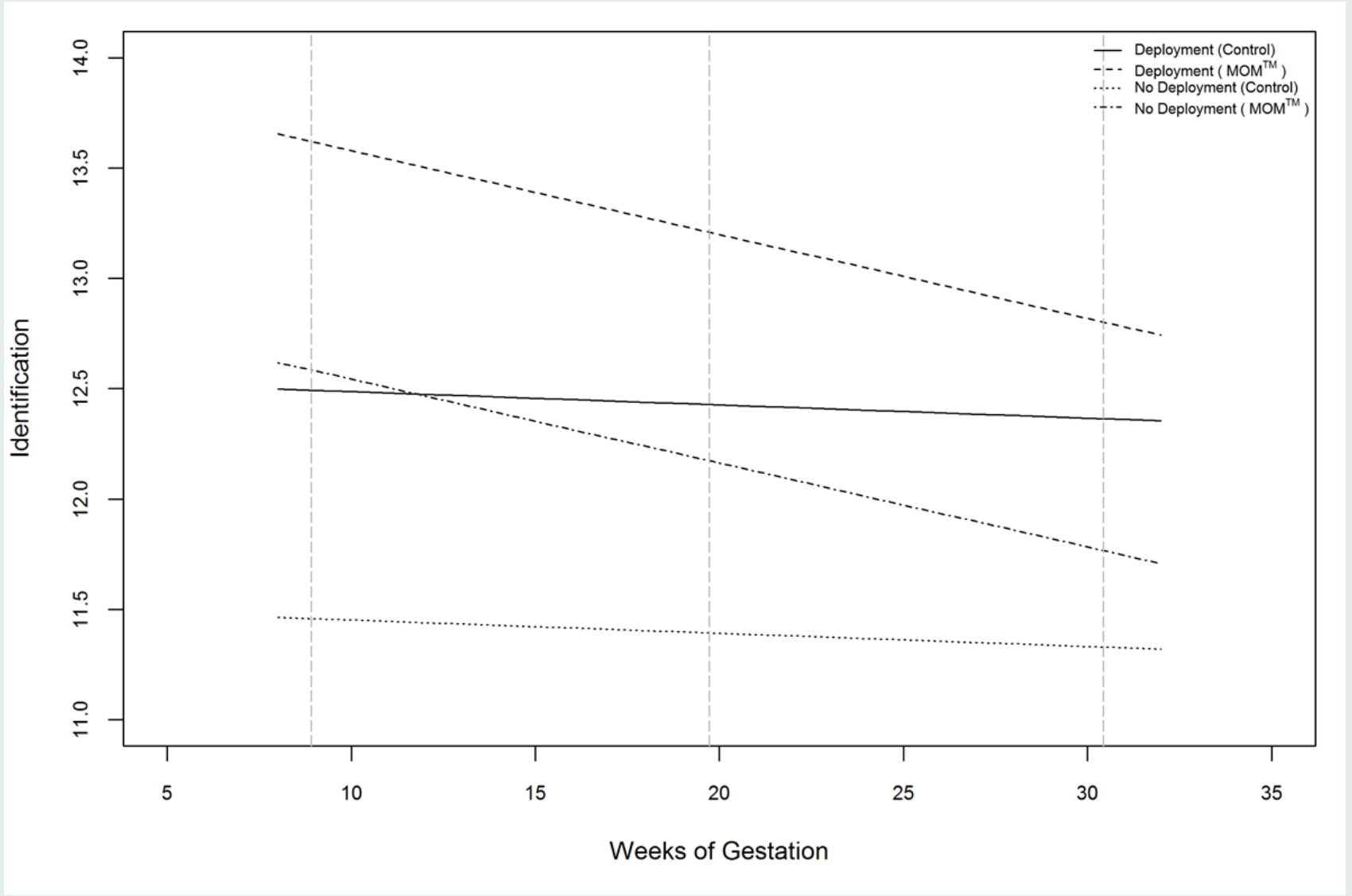
- Women with deployed partners during pregnancy had significantly greater anxiety for *Identification with a Motherhood Role* (p = .041)

Preparation for Labor

Parity was a significant predictor of anxiety related to labor

- Nulliparous women had significantly greater anxiety for *Preparation for Labor* (p = .0001)

Identification with a Motherhood Role and Deployment



Pregnancy Anxiety and Birth Outcomes

Preterm Birth

- **Anxiety for acceptance of pregnancy**
  Each 1/10 increment of anxiety increased the odds by 37%
- **Anxiety for preparation of labor**
  Each 1/10 increment of anxiety increased the odds by 60%
- **Anxiety for fears of helplessness and loss of control in labor**
  Each 1/10 increment of anxiety increased the odds by 54%

Low Birthweight

- **Anxiety for well-being of self and baby**
  Each 1/10 increment of anxiety increased the odds by 83%
- **Active duty women** were significantly more likely to have low birthweight infants

Preliminary Results for Multi-site Randomized Clinical Trial

Mentors Offering Maternal Support (M-O-M-S) Intervention to Determine Effect on Birth Outcomes

Multi-site RCT

- Large military OB populations
  - Naval Medical Center San Diego – over 3,000 deliveries a year
  - Madigan Army Medical Center, Ft Lewis-McCord, Washington – 2,700 deliveries a year
  - San Antonio Military Medical Center, 2,000 deliveries a year
- Randomize 1,200 women - to assess intervention effects on birth outcomes
- Data collection points at baseline, 16, 28, & 32 weeks; 1, 3, and 6 months postpartum

Current Demographics

- San Antonio = 464; Madigan = 406; Naval Medical Ctr San Diego = 285
- Ages 18-50 (*M* = 28.4, *SD* = 5.24)
- Married (88%)
- Employed (68%)
- College degree (41%)
- First pregnancy (48%)
- Active duty women (41%)
- Deployed partner during pregnancy (7%)
- Enlisted (84%)
- Air Force (23%), Army (42%), Navy (31%), Marine (4%)

Study Design

- Recruited, consented, randomized in the first trimester of pregnancy
- Randomized to MOMS group or prenatal care without the MOMS
- MOMS participants attended 10 , 1-hr classes every-other-week
- Completed questionnaires at baseline, 16, 24, 28, and 32 weeks & postpartum at 1, 3, and 6 monts postpartum.

Psychosocial Measures

- Maternal Prenatal Stress & Anxiety (PSEQ)
- Self Esteem (Rosenberg's Self-Esteem Scale
- Family Adaptability (FACES II)
- Prenatal Depression (EPDS)
- Perceived Support (SSI)
- Military Family Commitment (FIC)
- Resilience (BRS)
- Postpartum Maternal Adaptation (PPSEQ)

Analysis

- JBSA = 464, JBLM = 406, NMCSD = 285
- Linear mixed models developed to determine slope between the intervention and control groups for each dimension of anxiety/stress
- Intervention group and the interaction were included in the models as predictors with and without adjusting for:
  - age
  - employment
  - pregnancy #
  - martial/partner status
  - education
  - deployment of partner during pregnancy

Results

Women in M-O-M-S Intervention had:

- Statistically significant decreases in anxiety related to *Preparation for Labor (p = .005)*

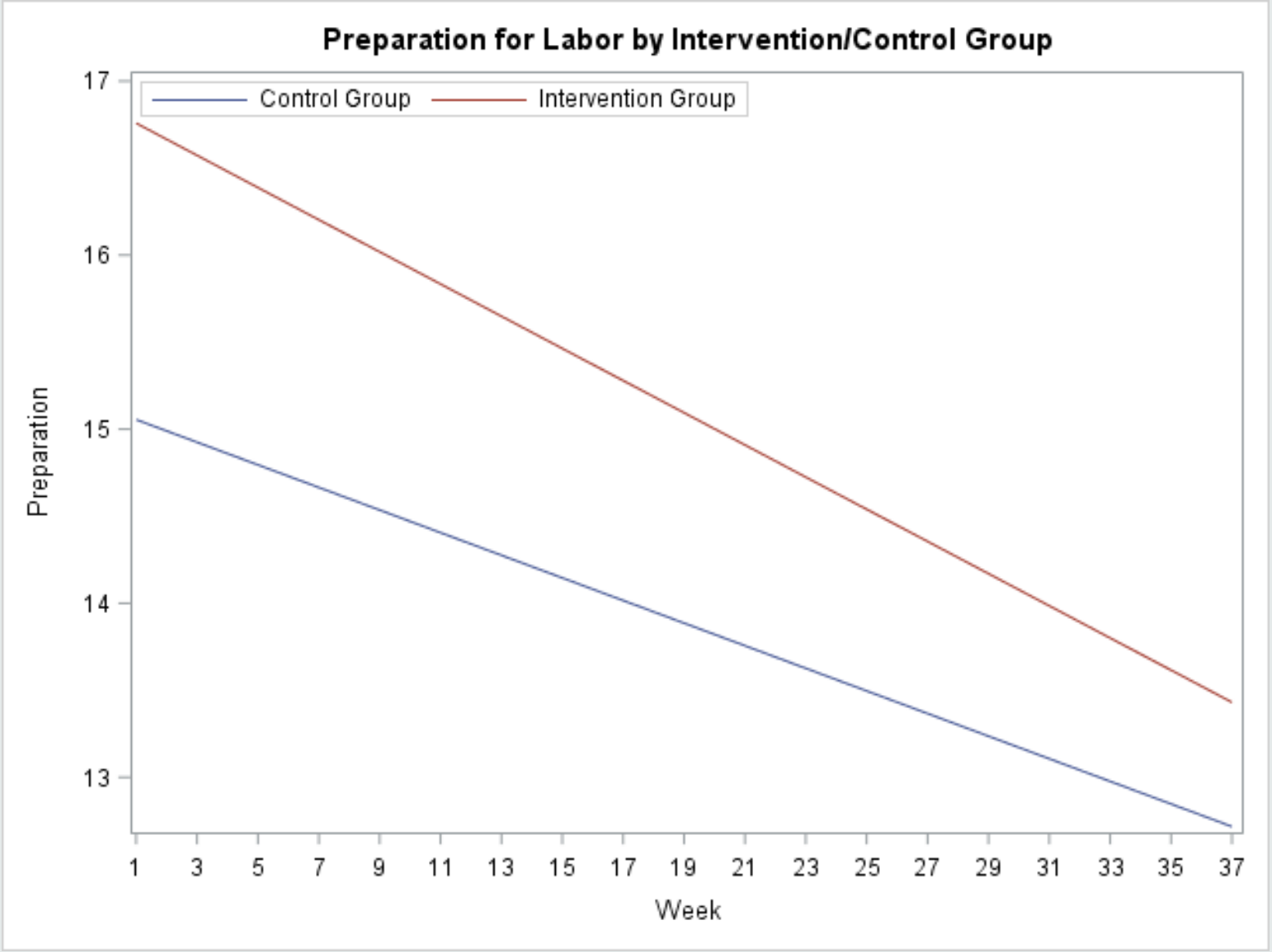
Solution for Fixed Effects

Effect	Control or Intervention	Estimate	Standard Error	DF	t Value	Pr > |t|
Intercept		15.1200	0.2196	1153	68.84	<.0001
TXGRP	Intervention	1.7306	0.3094	1153	5.59	<.0001
TXGRP	Control	0	.	.	.	.
time		-0.06495	0.005337	3251	-12.17	<.0001
time*TXGRP	Intervention	-0.02748	0.007917	3251	-3.47	0.0005
time*TXGRP	Control	0	.	.	.	.

Type 3 Tests of Fixed Effects

Effect	Num DF	Den DF	F Value	Pr > F
TXGRP	1	1153	31.29	<.0001
time	1	3251	395.10	<.0001
time*TXGRP	1	3251	12.04	0.0005

Preparation for Labor by Treatment/Control Groups



Results

Women in M-O-M-S Intervention had:

- Statistically significant decreases in anxiety related to *Relationship with Spouse/Partner (p < .03)*

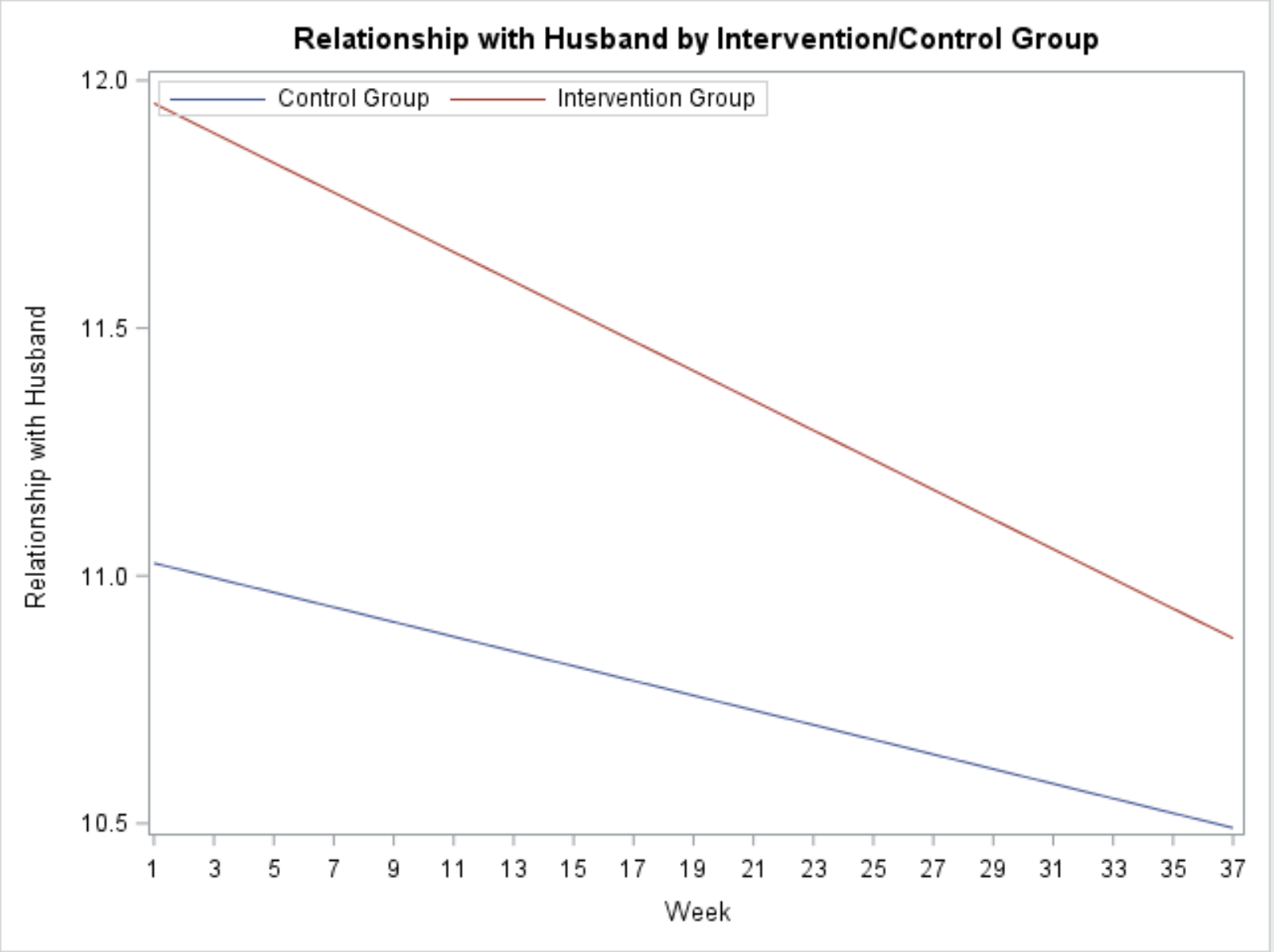
Solution for Fixed Effects

Effect	Control or Intervention	Estimate	Standard Error	DF	t Value	Pr > |t|
Intercept		11.0405	0.1789	1152	61.71	<.0001
TXGRP	Intervention	0.9432	0.2522	1152	3.74	0.0002
TXGRP	Control	0	.	.	.	.
time		0.01485	0.004596	3250	3.23	0.0012
time*TXGRP	Intervention	-0.01515	0.006817	3250	-2.22	0.0263
time*TXGRP	Control	0	.	.	.	.

Type 3 Tests of Fixed Effects

Effect	Num DF	Den DF	F Value	Pr > F
TXGRP	1	1152	13.99	0.0002
time	1	3250	4.56	0.0328
time*TXGRP	1	3250	4.94	0.0263

Relationship with Spouse/Partner by Treatment/Control Groups



Results

Active Duty Women:

- Statistically significant increase in anxiety related to *Preparation for Labor* (p = .02)

Solution for Fixed Effects

Effect	Active_duty	Estimate	Standard Error	DF	t Value	Pr > |t|
Intercept		15.5371	0.2034	1140	76.39	<.0001
Active_duty	1	1.0831	0.3180	1140	3.41	0.0007
Active_duty	0	0	.	.	.	.
time		-0.07063	0.005123	3245	-13.78	<.0001
time*Active_duty	1	-0.01836	0.008028	3245	-2.29	0.0223
time*Active_duty	0	0	.	.	.	.

Type 3 Tests of Fixed Effects

Effect	Num DF	Den DF	F Value	Pr > F
Active_duty	1	1140	11.60	0.0007
time	1	3245	395.24	<.0001
time*Active_duty	1	3245	5.23	0.0223

Results

Number of Deliveries:

- Statistically significant increases in anxiety related to
  - *Acceptance (p <.001) (anxiety > for first-time Mom)*
  - *Identification of Motherhood (p < .001) (> for first-time Mom)*
  - *Preparation for Labor (p* < .001) (anxiety > for first-time Mom)
  - *Helplessness (p < .001) (anxiety > for first-time Mom)*
  - *Well-Being (p = .001) (anxiety > for first-time Mom)*
  - *Relationship with Mother (p = .001) (anxiety > for over 3 children)*
  - *Depressive Symptoms (p = .01) (Depressive symptoms > for 1-2 deliveries vs. zero or greater than 3).*

Maternal Identity Formation - Psychological Health

- A sustained act
- Pursuit of an ideal – perfectability in making a child & becoming a mother
- Information & support/help is recruited
- Process aligned with time – orders behavior/activity
  - Too little time for pregnancy raises anxiety to fear
- Requires "loosening" and realignment of responsibilities to other persons
- Reorganization of relationships
- Self-concepts are reorganized (review in memory of who & what she has been)
- Requires a listener

(Rubin, 1984)

Perinatal Mental Health

- 14% - 23% of women affected prenatally by anxiety/mood disorders
- 11% - 21.9% of women affected in postpartum period by anxiety/mood disorders
- In 2015, American College of Obstetricians & Gynecologists (ACOG), recommended increasing perinatal screening and having treatment & referral plans
- Must build capacity to care for women's mental health care needs both pre- and post-natally

Davis et al., 2018

Future Research – Implications for Military Medicine

- Longitudinal studies starting in the first trimester
- Perinatal studies of reactivity to a stressor or trigger
- Assessing placental changes related to perinatal anxiety/stress
- Biomarkers in pregnancy and relationship to birth outcomes/physiologic changes
- Biomarkers and relationship to psychosocial measures - interventions
- **Need military support programs focused on pregnancy anxiety and depressive symptoms and must identify those in need of perinatal/postpartum treatment**
- **Obvious anxiety r/t to preparation for labor/well-being points to need for focus on birthing classes & perinatal education**
- **Emphasis on postpartum depression requires perinatal assessment/intervention**
- **If maternal-child care is sent out to the civilian community – MUST incorporate some type of support and connectedness with the military community**

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M-O-M-S Research Team: Katherine Walker, Julie Farhat, Monica Lutgendorf, Meagan Petersen, & Wenyaw Chan

Preliminary Results For DoD Funded Prenatal Support Program

Karen L. Weis, PhD, RNC-OB, FAAN, Col (ret)
Professor, BG Lillian Dunlap Endowed Chair
University of the Incarnate Word