Table I. Studies on the effect of relaxation therapy during pregnancy on mother, fetus and the newborn. Grouped by technique (relaxation, massage and yoga).

Authors, year	Study Type	Type of relaxation therapy	Dependent variable	Subjects/time point of assessment	Results
		Relaxation			
[20] Little et al. (1984)	- sequentially assigned to groups	- Relaxation and biofeedback weekly - 6 weeks - Audio tape with relaxation instructions - Home exercise Group A: relaxation alone Group B: biofeedback and relaxation Group C: CG without relaxation	- Hospital admission - Number of days in hospital - BP - Pregnancy outcome: duration of labor, type of analgesia, postnatal maternal BP, birth weight, Apgar score, head circumference	$N = 60$ Groups A and B: n = 18 Group C: n = 24 Women with blood pressure $\geq$ 135/85 mm Hg Weeks of gestation: n.n.	- Groups A and B: Less admission to hospital ($p < .01$), fewer days in hospital ($p < .03$) and lower mean diastolic BP ($p < .03$) - Group A: lower systolic BP compared to group C ($p < .001$) (difference between group B and group C not significant)
[45] Omer et al. (1986)	- randomized controlled	- 1-3 hypnotic-relaxation sessions (30 min) - Audio tape - twice a day during hospital stay - once a day after discharge EG: Medication + hypnotic relaxation CG: medication alone	Pregnancy outcome: - RPP - birth weight - infant mortality	$N = 113$ EG: n = 39 CG: n = 74 Women hospitalized with diagnosed premature contractions Weeks of gestation: 26 - 34 until 37	EG compared to CG - higher RPP ($p < .002$) - Higher birth weight ($p < .005$)

[42] Janke (1999)	- Randomize d controlled	EG: Progressive relaxation exercise (once daily) CG: No intervention NG (Nonadherent group): Discontinuation of progressive relaxation exercise after 1-2 weeks	Pregnancy outcome - RPP - gestational age - birth weight	$N = 107$ EG: n = 44 CG: n = 40 NG: n = 23 Women diagnosed with preterm labor Weeks of gestation: n.n.	EG compared to CG and NG: - Longer gestations (p < .001) - higher RPP (p < .001) - higher birth weight (p < .001)
[32] Urizar et al. (2004)	- not randomized	SR condition: Stress reduction instructions to plan and engage in stress reduction behaviors NSR condition: No stress reduction instructions - 1 days	- Stress rating - CES-D - PANAS - Endocrine assay: morning C	$N = 41$ Predominantly low-income Latina women Weeks of gestation: 6 – 32	SR compared to NSR condition: - Lower levels of perceived stress (p < .001) - Lower levels of depression (p = .002) - Lower levels of negative affect (p < .01) - Lower morning C levels (p = .01)
[36] Bastani et al. (2005)	- Randomize d controlled	- Seven 90-min sessions of applied relaxation according to Ost (1987) - 7 weeks - Daily practice at home EG: applied relaxation CG: routine prenatal care	- STAI state and trait - PSS	$N = 110$ EG: n = 55 CG: n = 55 Iranian women with moderate to high anxiety (STAI State/Trait > 20) Weeks of gestation: 14 – 28	EG compared to CG - Lower levels of anxiety (state and trait) (p < .001) - Lower levels of perceived stress (p < .001)

[24] Teixeira et al. (2005)	- randomized	- Single imagination exercise - 45 min AR: Active relaxation group PR: Passive relaxation group (Quiet sitting)	- STAI - Endocrine assays: NE, E, C - Doppler scan: uterine RI	$N = 58$ AR: n = 29 PR: n = 29 Weeks of gestation 28 – 32	AR: - Higher reduction of state anxiety (p < .0001) - Higher reduction of maternal HR (p < .0001) PR: - Higher increase of uterine RI (p = .002) - Higher reduction of NE (p = .02) AR and PR: - Equal decline of C levels (p = .002, p = .001)
[40] Bastani et al. (2006)	- Randomized controlled	- Seven 90-min sessions of applied relaxation according to Ost (1987) - 7 weeks - Daily practice at home EG: applied relaxation CG: routine prenatal care	- Birth weight - Gestational age at birth - Type of delivery	$N = 110$ EG: n = 55 CG: n = 55 Weeks of gestation: 14 – 28	EG compared to CG: - Higher mean birth weight (p < .009) - Lower rates of low birth weight (< 2500g) (p < .003) - Fewer abnormal types of delivery (p = 0.002) - Rates of preterm birth (< 37 weeks) one versus five, n.s., (p = .102) EG and CG: Equal gestational age at birth (p < .689)

[22] Nickel et al. (2006)	- Randomized controlled	- PMR sessions of 30min - 3 times a week - Over 8 weeks - At home: daily practice for 15min twice a day EG: PMR CG: Placebo intervention (movement of the extremities)	- HR - BP - STAXI - SF-36	$N = 64$ EG: n = 32 CG: n = 32 Women hospitalized with bronchial asthma Weeks of gestation: n.n.	EG compared to CG: - Decrease of systolic BP (p < .001) - Decrease of HR (p < .001) - Lower levels of anger (STAXI) (p < .01) - Higher levels in health-related quality of life (SF-36) (physical functioning: p = .06, role physical: p = .02, bodily pain: p = .04, general health perceptions: p = .02, vitality: p < .001, social functioning: p < .001, role emotional: p < .001, mental health: p < .01)
[44] Saisto et al. (2006)	- Randomized controlled	- Group sessions (120 min) consisting discussions, visualization and relaxation exercises - Once a week over 5 weeks EG: Group sessions CG: 2 meetings with an obstetrician for 20-40min to discuss fear and mode of delivery	- Mode of delivery - Duration of labor and delivery - Epidural analgesia during vaginal delivery	$N = 187$ EG: n = 102 CG: n = 85 Women with fear of childbirth Weeks of gestation: 31	EG compared to CG: - Higher rates of vaginal delivery (p = .02) - Lower rates of elective caesarean sections (p = .05)

[19] DiPietro et al. (2008)	- randomized	- Single guided imagery progressive relaxation session - 18min EG: 18min baseline and 18min relaxation exercise CG: 18min pre baseline, 18min baseline, relaxation exercise	- HR - Skin conductance level - FM, FHR, FHR variability, FM-FHR-coupling - Uterine and umbilical artery RI - Endocrine assay: C	$N = 100$ Weeks of gestation: 32	Maternal results: - Reduction of HR (p < .0001), skin conductance level, C (p < .0001), RI in umbilical artery (p < .01) Fetal results: - Reduction of FHR (p < .05) and FM (p < .0001) - Increase of FHR-variability (p < .01) and FHR-FM-coupling (p = .001)
[38] Vieten & Astin (2008)	- Randomized controlled	- Mindful motherhood intervention (breath awareness, guided body awareness meditation, yoga, acceptance and cultivation an observing self) - 2h weekly - Over 8 weeks EG: Mindful motherhood intervention CG: Randomized wait-list control group	- PSS - CES-D - STAI - PANAS-X	$N = 31$ EG: n = 13 CG: n = 18 Weeks of gestation: 12 – 30	EG compared to CG: - Lower levels of state anxiety (p < .05) - Lower levels of negative affect (p < .04)

[25] Urech et al. (2010)	- Randomized controlled	- Single relaxation exercise - 10min - Practice at home PMR: Progressive muscle relaxation GI: Guided imagery CG: Passive relaxation, control condition	- Endocrine assays: C, ACTH, NE, E - HR - BP - STAI - VAS	$N = 39$ PMR: n = 13 GI: n = 13 KG: n = 13 Weeks of gestation: 32 - 34	GI compared to PMR and CG: - Higher levels of perceived relaxation (VAS) (p = .007) GI and PMR compared to CG: - Lower HR levels (p = .027) All groups: - Lower levels of C, ACTH and NE (p < .001)
[46] Fink et al. (2011)	- Randomized controlled	- Single relaxation exercise - 10min - Practice at home PMR: Progressive muscle relaxation GI: Guided imagery CG: Passive relaxation, control condition	- FHR, FHR variability, fetal movement	$N = 39$ PMR: n = 13 GI: n = 13 KG: n = 13 Weeks of gestation: 32 – 34	GI, PMR, CG: - no significant findings regarding FHR GI and PMR compared to CG: - Higher FHR long-term variation during and after relaxation (*p* = .039) GI compared to PMR: - GI fetuses showed more fetal body movements after relaxation (p = .027).
		Massage			

| [31]
Field et al.,
(1999) | - randomized | - Sessions of 20min twice a week over 5 weeks

MT group: Massage therapy
PMR group: Progressive muscle relaxation | - STAI
- POMS-D
- CES-D
- Perinatal Anxieties and Attitudes Scale
- Maternal-Fetal Attachment Scale
- OCS
- PNF
- Endocrine assays: Cortisol, NE, E, D, S | $N = 26$
MT group: n = 14
PMR group: n = 12

Weeks of gestation: 14 – 30 | Short-term measures (pre-post session):
MT group: Mood improvement (p < .005)
MT and PMR group: Lower levels of anxiety (p < .01)
Long-term measures (first/last day):
MT group: Better pregnancy report, less worries (p < .001), increased perceived social support (p < .05), fewer obstetric and postnatal complications (p < .05), decrease of NE (p < .01), increase of dopamine (p < .01), no changes in cortisol (p = .60)
PMR group: more worries (p < .01), lower level of perceived social support (p < .05)
MT and PMR group: increase of D (p < .01, p < .05) |

[29]
Field et al.
(2004)
	- Randomize
	d controlled
		MT group:
		Massage therapy, 20min, twice a week
		over 16 weeks
		PMR group:
		PMR, 20 min, twice a week over 16
		weeks
		CG group:
		Standard prenatal care over 16 weeks
		ND-CG group:
		Non-depressed CG with standard prenatal
		care
			- STAI
			- POMS
			- CES-D
			- OCS
			- PNF
			- Endocrine assays: C, NE, D,
			  S
			- Fetal activity
			- NBAS
				$N = 112$
				n = 28 in each group
				Depressed women
				
				Weeks of gestation:
				18 – 24
					Short-term measures (pre-
					post session):
					- MT group: increase of S
					  and D, decrease of C and
					  NE (p = < .05) mood
					  improvement (p < .05),
					  lower levels of anxiety
					  (p < .05)
					
					Long-term measures
					(first/last day):
					- MT group: decrease of
					  levels of depression (p <
					  .05) and fetal activity (p
					  < .05), fewer obstetric
					  complications (p < .05)
					- MT and PMR group:
					  Fewer postpartum
					  complication (p < .05),
					  better performance on
					  the NBAS (p < .05)

[50]
Field et al.
(2006)
	- randomized	- Massage sessions of 20min twice a
		  week over 16 weeks
		
		MPM group: Moderate pressure massage
		(indentation of the skin)
		LPM group: Light pressure massage
		(brush the surface of the skin)
			- Behavior observation
			- NBAS
				$N = 64$
				MPM: n = 34
				LPM: n = 30
				Newborns (1 week of
				age) of depressed
				mothers (CES-D $\geq$ 16)
				
				Weeks of gestation:
				During second trimester
					MPM compared to LPM:
					- More smiling (p < .01)
					  and vocalizing during
					  observation time (p <
					  .05)
					- Better scores on
					  orientation (p < .05),
					  motor (p < .05),
					  excitability (p < .01),
					  and depression cluster of
					  NBAS (p < .05)

[37] Field et al. (2008)	- randomized	- 20min massage sessions - Applied by partner - Twice a week - Over 16 weeks EG: Massage therapy CG: not described (most likely no massage)	- CES-D - STAI - STAXI - Relationship Questionnaire	$N = 47$ EG: n = not described KG: n = not described Weeks of gestation: Second trimester	EG compared to CG: - Women: Lower levels of depression (p < .001), anxiety (p < .001) and anger (p < .01), improvement in relationship (p < .01) - Partners: Lower levels of depression (p < .01) and anxiety (p < .01) and improvement in relationship (p < .05)
		Yoga			
[21] Narendran, Nagarathna, Narendran et al. (2005)	- Not randomized	- Integrated approach of yoga therapy (IAYT) - 1h daily practice - Practice until delivery EG: IAYT CG: walking half an hour twice a day	- PIH - IUGR - Mode of delivery - Gestational age at delivery - Birth weight	$N = 335$ EG: n = 169 CG: n = 166 Weeks of gestation: 18 – 20	EG compared to CG - Lower rates of preterm deliveries (p = .10) - Lower rates of small-for-gestational-age babies (p = .12) - Idiopathic IUGR (p = .003) and IUGR associated with PIH in the EG (p = .025)
[43] Narendran, Nagarathna, Gunasheela et al. (2005)	- Not randomized	- Integrated approach of yoga therapy (IAYT) - 1h daily practice - Practice until delivery EG: IAYT CG: walking half an hour twice a day	- PIH - IUGR - Birth weight - Preterm delivery	$N = 121$ EG: n = 68 CG: n = 53 Additional subsample with Doppler abnormalities Weeks of gestation: 18 – 20	EG compared to CG - Higher birth weight (p < .018)

[41] Chuntharapat et al. (2008)	- randomized	- Six 60min yoga sessions - Practice at home - At least three times a week EG: Yoga sessions CG: Routine nursing care	- STAI - VASTC - MCQ - VASPS - Apgar scores - Duration of labor	$N = 66$ EG: n = 33 CG: n = 33 Weeks of gestation: 26 – 37	EG compared to CG: - Higher maternal comfort during labor and 2h after birth (p < .05) - Lower levels of pain during labor (p < .05) - Lower duration of labor (p < .05)
[23] Satyapriya et al. (2008)	- randomized	- Integrated approach of yoga therapy (IAYT) - First month: 2-hour sessions 3 days per week from trained instructors - After first month: 1-hour sessions daily at home EG: IAYT CG: standard prenatal exercises	- PSS - HR variability: low frequency bands, high frequency (HF) bands, LF/HF ratio	$N = 99$ EG: n = 45 CG: n = 45 Weeks of gestation: 18 – 20	EG compared to CG: - Lower levels of perceived stress (PSS) (p = .001) Heart rate variability in pre-during-session: - Equal decrease of LF bands (p < .001) and LF/HF ratio (p < .001) - Equal increase of HF bands in pw 20 (p < .001) - Increase of HF bands in pw 36 in EG only (p < .001) Heart rate variability in pre-post-session: - Decrease of LF bands in EG only in pw 36 (p < .001) - Equal reduction of LF/HF ratio in pw 36 (p < .001) - Equal increase of HF bands in pw 36 (p < .001)

BP: Blood pressure; C: Cortisol; CES-D: Center for Epidemiological Studies-Depression Scale; CG: Control group (= no experimental treatment); D: Dopamine;
E: Epinephrine; EG: Experimental / Treatment group; FHR: Fetal heart rate; FM: Fetal movement; HR: heart rate; IAYT: Integrated approach of yoga therapy;

IUGR: Intrauterine growth retardation; MCQ: Maternal comfort questionnaire; NBAS: Brazelton Neonatal Behavior Assessment Scale; NE: Norepinephrine; OCS: Obstetric Complications Scale; PANAS: Positive and Negative Affect Schedule; PANAS-X: Positive and Negative Affect Schedule – Extended; PIH: Pregnancy induced hypertension; PMR: Progressive muscle relaxation; PNF: Postnatal Factor Scale; POMS-D: Profile of Mood States Depression Scale; pw: Pregnancy week; PSS: Perceived Stress Scale; RI: Resistance index; RPP: Rate of pregnancy prolongation; S: Serotonin; SF-36: Health Survey Questionnaire; STAI: State-Trait Anxiety Inventory; STAXI: State-Trait Anger Expression Inventory; VAS: Visual analogue scale; VASPS: Visual analogue sensation of pain scale; VASTC: Visual analogue scale to total comfort.