

Journal Club

Title of paper : Five-week yin yoga-based interventions decreased plasma adrenomedullin and increased psychological health in stressed adults: A randomised controlled trial (Daukantaite et al,2018)

Presenter: Aditi Devi N, PhD Scholar, Dept of Psychiatry

Chair: Dr Bharath Holla, Assitant Professor, Centre for Integrative Medicine and Research (CIMER)

Time: 9.15 am

Venue: Hall 3 (first floor)

RESEARCH ARTICLE

Five-week yin yoga-based interventions decreased plasma adrenomedullin and increased psychological health in stressed adults: A randomized controlled trial

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Background

- Non communicable diseases
- Stress, anxiety and depression

- Yoga intervention

Adrenomedullin (ADM)

- Multifunctional regulatory peptide – vasodilation, cell growth, regulation of hormone secretion, natriureisis, antimicrobial effects
- CGRP superfamily
- Regulated by inflammation and oxidative stress
- 2-10pM normal plasma
- Calcitonin receptor like receptor/ RAMP complex
- cAMP, Akt, MAPK-ERK signalling

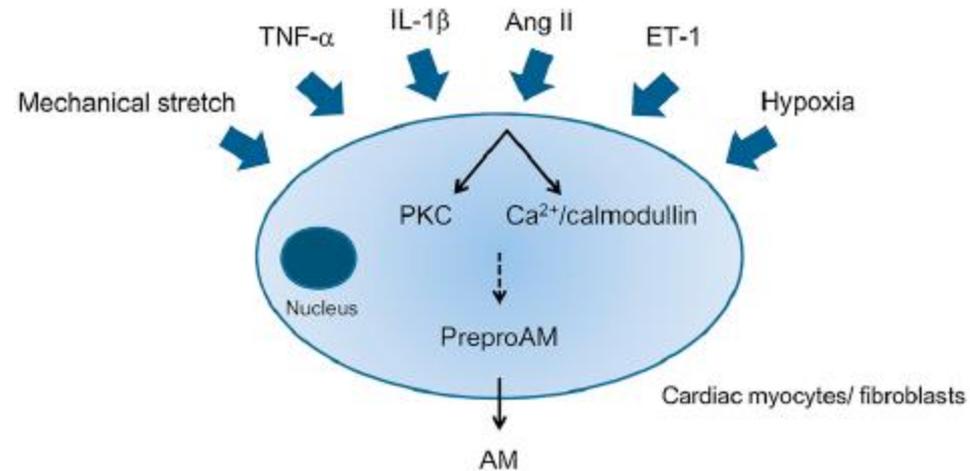
■ Plasma elevations – NCDs

■ ADMs – BMI

■ Vascular and cardiac stress

■ Hypertension, renal stress

■ Exercise



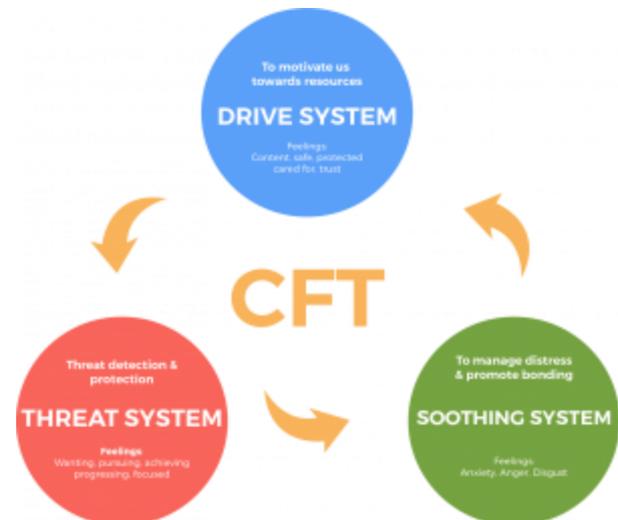
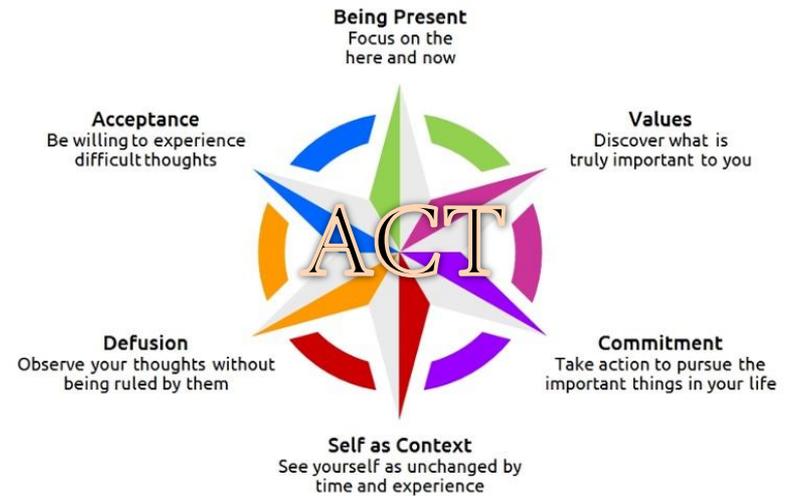
Yin Yoga

- Meditative form of Hatha Yoga
- Calmness and mindfulness
- Seated and lying postures
- Deep breathing



YOMI program

- Yoga and Mindfulness
- Psychoeducation
- Acceptance and Commitment Therapy (ACT)
- Compassion Focused Therapy (CFT)

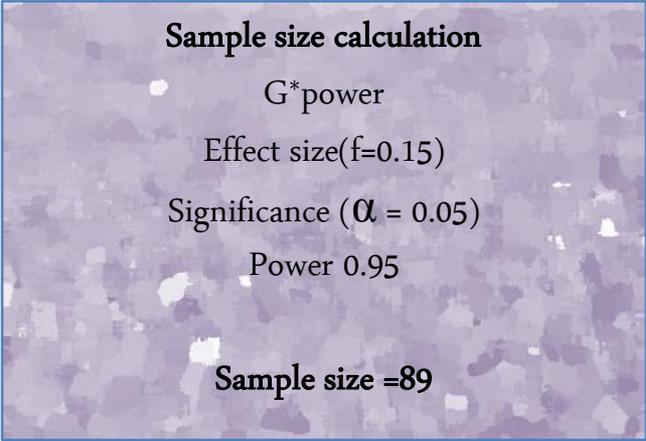


Hypothesis

1. The Yin Yoga and YOMI program will reduce levels of ADM, perceived stress, anxiety, depression and sleep
2. Changes in ADM are related to changes on psychological health variables

Participants

- Sweden
- Advertisements in local newspapers
- People experiencing chronic stress
- Ethical considerations

A purple rectangular box with a blue border containing text about sample size calculation. The text is centered and reads: "Sample size calculation", "G*power", "Effect size(f=0.15)", "Significance (α = 0.05)", "Power 0.95", and "Sample size =89".

Sample size calculation
G*power
Effect size(f=0.15)
Significance ($\alpha = 0.05$)
Power 0.95
Sample size =89

The inclusion criteria

- Experiencing moderate to high stress in everyday life for the past month (i.e. had a total score of 8 or higher [on a range of 0 to 16] on the 4 selected items from the Perceived Stress Scale [PSS])
- Being physically fit enough (based on a self-report) to perform slow but deep yoga postures
- Could participate during the intervention period, and
- Aged 40±65 years.

The exclusion criteria

- Previous regular yoga or mindfulness practice (i.e. more than 6 months of practice in the past year),
- Current psychological or psychopharmacological treatment,
- Inability to attend more than 5 of the scheduled 10 yoga sessions

Interventions

Yin yoga

- 60 minutes
- Twice a week
- 5 consecutive weeks

YOMI program

- 60 minutes Yin yoga
- 30 minutes psychoeducation and mindfulness practice
- Twice a week
- 5 consecutive weeks

YOMI program themes

- Observation and breathing
 - Our five senses
 - Balance
 - Acceptance
 - Self care

S1 Table. Topic of each session of the YOMI program

Session		Topic	Summary of content
Week 1	Session 1	Presentation and introduction	Psychoeducation: Introductory lecture to yoga and mindfulness, stress, yin and yang. Mindfulness: Short story about mindfulness. Yin yoga: Practice introducing the yin yoga program and different asanas.
	Session 2	Observation and breathing	Psychoeducation: Lecture on the breath, its physiology and function during stress and worry. Introduction to an observational mindset. Mindfulness: Breathing exercise 'counting breath', body scan with physical tension and relaxation. Yin yoga: Practice focused on breathing and observing thoughts, emotions and bodily sensations.
Week 2	Session 3	Our five senses.	Psychoeducation: Introduction to our five senses. Lecture on non-reactive observation and theory of grasping-rejecting. Mindfulness: Breathing exercise 'ujjayi pranayama'. Co-breathing exercise. Mindfulness eating exercise focusing on exploring all five senses. Yin yoga: Practice focusing on observing all five senses, physical aspects of yin yoga.
	Session 4	Balance	Psychoeducation: Lecture on finding balance between activity and restoration, the sympathetic and parasympathetic nervous system. Introducing the three emotion regulation systems and the concept of function and form. Mindfulness: Breathing exercise 'Nadi Shodhana'. Exercise 'Three circles'. Yin yoga: Practice focusing on self-compassion, using the concepts of function and form.
Week 3	Session 5	YOMI-practice	Psychoeducation: recap of lectures from session 1-4 Mindfulness: Meditation on breathing and letting go. Yin yoga: Practice focusing on exploring one's practice.
	Session 6	Introduction to acceptance	Psychoeducation: Lecture introducing the definition of acceptance, true/false acceptance, introducing defusion. Mindfulness: Mindfulness exercise on observing automatic thoughts. Meditation on passing clouds. Meditation on acceptance. Yin yoga: Practice focusing on acting non-reactive and non-judgmental.
Week 4	Session 7	Applications of acceptance	Psychoeducation: Lecture on acceptance, applications of acceptance, functional contextualism and compassion. Introduction of "SOAS". Mindfulness: SOAS. Compassion meditation

			Yin yoga: Practice focusing on acceptance, letting go, using SOAS and compassion.
	Session 8	Self-care	Psychoeducation: Lecture on self-care, the concepts of form and function. Introduction of tactile touch as calming tool. Mindfulness: Tactile massage, self compassion meditation Yin yoga: Practice focusing on exploring self-care using self-compassion and previously introduced tools.
Week 5	Session 9	YOMI practice	Psychoeducation: recap of lectures from session 6-8 Mindfulness: Meditation on conscious breath and happiness Yin yoga: Practice focusing on silence and being in stillness
	Session 10	YOMI in the everyday life.	Psychoeducation: Lecture on how the YOMI practice can be used in the everyday life. Introducing the concept of 'monkey mind'. Mindfulness: Walking meditation Yin yoga: Practice focusing on combining all tools and concepts of the program

Investigations

- Fasting blood sample – Adrenomedullin
- Perceived Stress Scale (PSS)
- The Hospital Anxiety and Depression Scale (HADS)
- The Insomnia Severity Index (ISI)

Statistics

- ANOVA
- Independent sample t test
- Chi square test
- Regression Analysis
- Pearsons correlations

Results

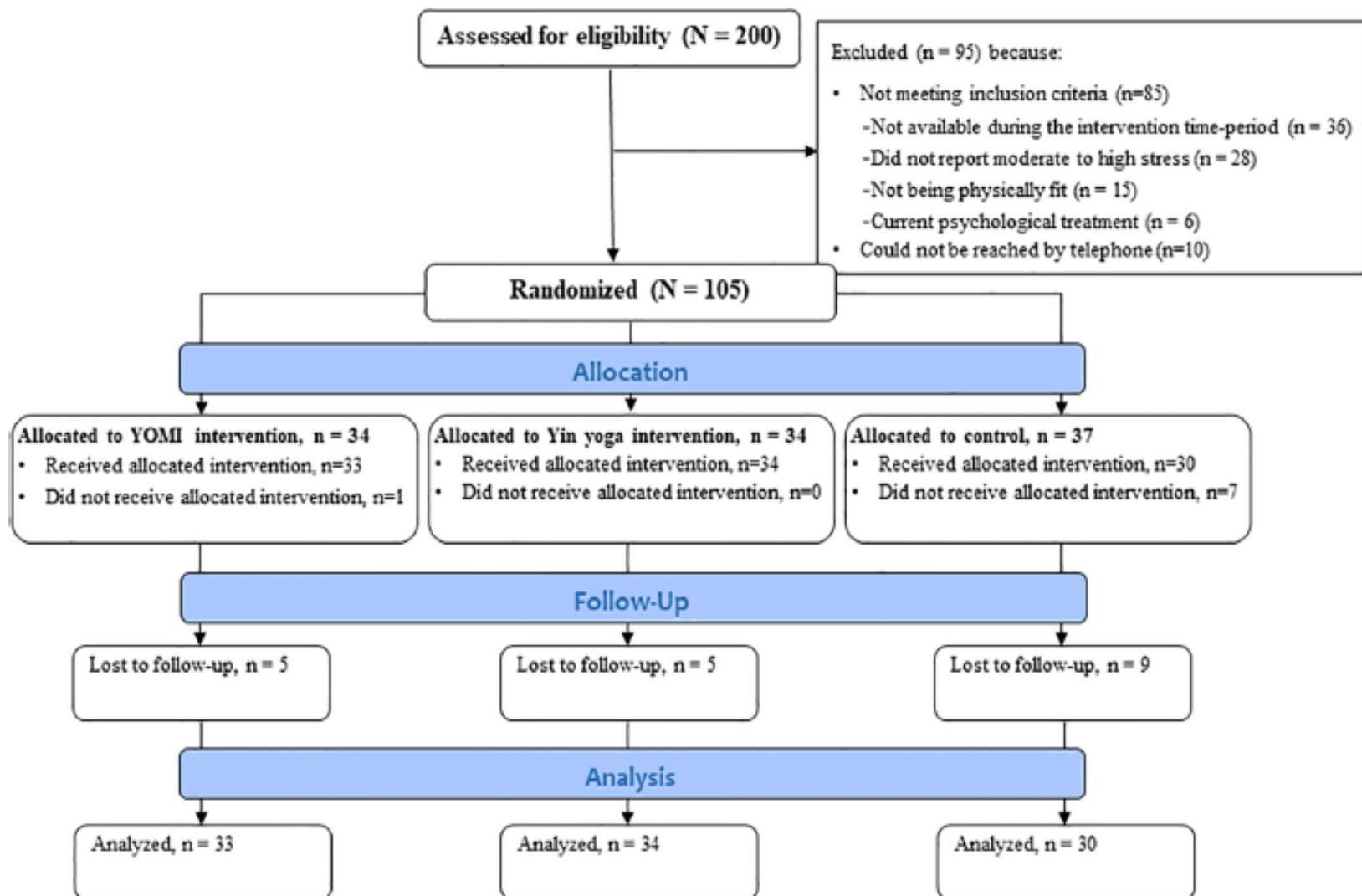


Fig 1. CONSORT flow diagram.

Table 1. Descriptive statistics of the participants at baseline.

Variable	Group			p values
	YOMI (n = 33)	Yin Yoga (n = 34)	Control (n = 30)	
Sex (women, n %)	26 (79%)	27 (79%)	23 (77%)	0.96
Age (M±SD)	54.4 ± 7.0	53.4 ± 5.7	52.6 ± 6.8	0.56
Education (n %)				0.64
High school degree	11 (33.3%)	15 (44.1%)	12 (40.0%)	
Bachelor's/Master's degree	19 (57.6%)	19 (55.9%)	17 (56.7%)	
Other	2 (6.1%)	0 (0%)	1 (3.3%)	
Marital status (n %)				0.47
Single	9 (27.3%)	10 (29.4%)	5 (16.7%)	
Married/co-habiting	24 (72.7%)	23 (67.7%)	25 (83.3%)	
Other	0 (0%)	1 (2.9%)	0 (0%)	
Employment status (n %)				0.73
Full/part-time job	28 (84.8%)	29 (85.3%)	27 (90%)	
Unemployed	1 (3%)	2 (5.9%)	2 (6.7%)	
Other	4 (12.1%)	3 (8.8%)	1 (3.3%)	
Body mass index (M (kg/m ²) ± SD)	25.6 ± 4.2	25.3 ± 5.0	26.1 ± 4.2	0.78
Cystatin C (mg/L) (M±SD)	0.88 ± 0.1	0.84 ± 0.1	0.90 ± 0.2	0.10
ADM [†] (M±SD)	6.1 ^{ab} ± 0.3	5.8 ^a ± 0.3	5.9 ^b ± 0.4	0.01
Perceived stress (M±SD)	20.6±5.9	19.3±5.7	19.2±6.2	0.55
Anxiety (M±SD)	11.3 ^a ±3.6	10.3±3.6	8.9 ^a ±4.1	0.05
Depression (M±SD)	6.4±3.3	6.2±2.9	5.6±3.3	0.61
Insomnia (M±SD)	20.2±5.9	20.7±6.2	18.1±6.7	0.23

Note. ADM = adrenomedullin.

[†]Expressed as a relative concentration, NPX units.

^{a,b}Means sharing the same superscript are significantly different between the groups.

Table 2. Means and standard deviations (in parentheses) on study outcomes at two time points.

Variable	YOMI Group		Yin Yoga Group		Control Group	
	Pre	Post	Pre	Post	Pre	Post
ADM	6.11 (0.30)	5.96 (0.37)	5.83 (0.34)	5.70 (0.31)	5.86 (0.38)	6.16 (0.44)
Perceived stress	20.64 (5.87)	12.75 (4.93)	19.32 (5.69)	14.10 (8.28)	19.17 (6.21)	14.71 (6.60)
Anxiety	11.27 (3.61)	7.11 (3.70)	10.29 (3.66)	6.90 (4.34)	8.87 (4.13)	7.76 (4.02)
Depression	6.36 (3.33)	3.61 (2.85)	6.18 (2.90)	4.41 (3.63)	5.60 (3.27)	3.81 (3.09)
Insomnia	20.24 (5.90)	15.25 (6.36)	20.68 (6.21)	17.07 (7.02)	18.10 (6.68)	16.90 (5.69)

Table 3. Correlations between the study outcomes at baseline.

	1	2	3	4	5
1. ADM	---	-.038	.066	.150	.055
2. Perceived stress		---	.697***	.552***	.470***
3. Anxiety			---	.569***	.441***
4. Depression				---	.517***
5. Insomnia					---

Note. ADM = adrenomedullin.

*** $p < .001$

Table 4. Results of multiple regression analyses.

	B	SE B	p	β
Adrenomedullin $R^2 = .39$				
Intervention				
YOMI	-0.34	0.08	$p < .001$	-.41
Yin yoga	-0.39	0.08	$p < .001$	-.46
Age	0.02	0.09	ns	.02
Sex	-0.00	0.01	ns	-.05
Cystatin	-0.34	0.33	ns	-.10
BMI	-0.01	0.01	ns	-.12
Constant	-7.14	6.72		
Perceived stress $R^2 = .08$				
Intervention				
YOMI	-3.99	1.59	$p = .012$	-.27
Yin yoga	-0.52	1.58	ns	-.04
Age	0.08	0.12	ns	.07
Sex	-0.64	1.83	ns	-.04
Constant	-7.14	6.72		
Anxiety $R^2 = .33$				
Intervention				
YOMI	-3.55	0.71	$p < .001$	-.46
Yin yoga	-2.20	0.71	$p = .002$	-.29
Age	0.10	0.05	$p = .051$.18
Sex	0.19	0.82	ns	.02
Constant	-6.48	3.02		
Depression $R^2 = .07$				
Intervention				
YOMI	-1.67	0.72	$p = .021$	-.25
Yin yoga	-0.23	0.72	ns	-.04
Age	0.27	0.83	ns	.04
Sex	0.03	0.05	ns	.05
Constant	-2.74	2.96		
Sleep problems $R^2 = .33$				
Intervention				
YOMI	-4.53	0.90	$p < .001$	-.47
Yin yoga	-2.71	0.90	$p = .003$	-.28
Age	0.12	0.07	$p = .066$.17
Sex	0.89	1.04	ns	.08
Constant	-8.06	3.82		

Note. ADM = adrenomedullin, p values for ns vary between .211 and .971. Control group is a reference group. B coefficient refers to the expected increase/decrease in the dependent variable for one unit change in the independent variable. β coefficient refers to the number of standard deviation changes we would expect in the outcome variable for a 1 standard deviation change in the predictor variable.

Table 5. Pearson correlations between pre-post changes on adrenomedullin and psychological measures.

Change in	Adrenomedullin	
	r	P
Perceived stress	.16	.19
Anxiety	.28	.02
Depression	.25	.04
Sleep problems	.13	.31

Discussion

- ✓ YOMI based pilot study
- ✓ Short yoga interventions with important benefits
- ✓ Changes in ADM not significantly related to perceived stress levels
- ✓ Yin yoga with psychoeducation
- ✓ ADM not a causal factor

- ✓ Attrition

Critique

- ✓ Title
- ✓ Sampling
- ✓ Sample size
- ✓ Web based assessments
- ✓ Primary objective
- ✓ Psychoeducation alone as an intervention
- ✓ Placebo control
- ✓ ? Weakly significant result

Future directions

- Generalizability of data
- ADM as a potential marker for Mental Health
- Placebo control
- Screening/ assessments by Psychiatrist

References

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