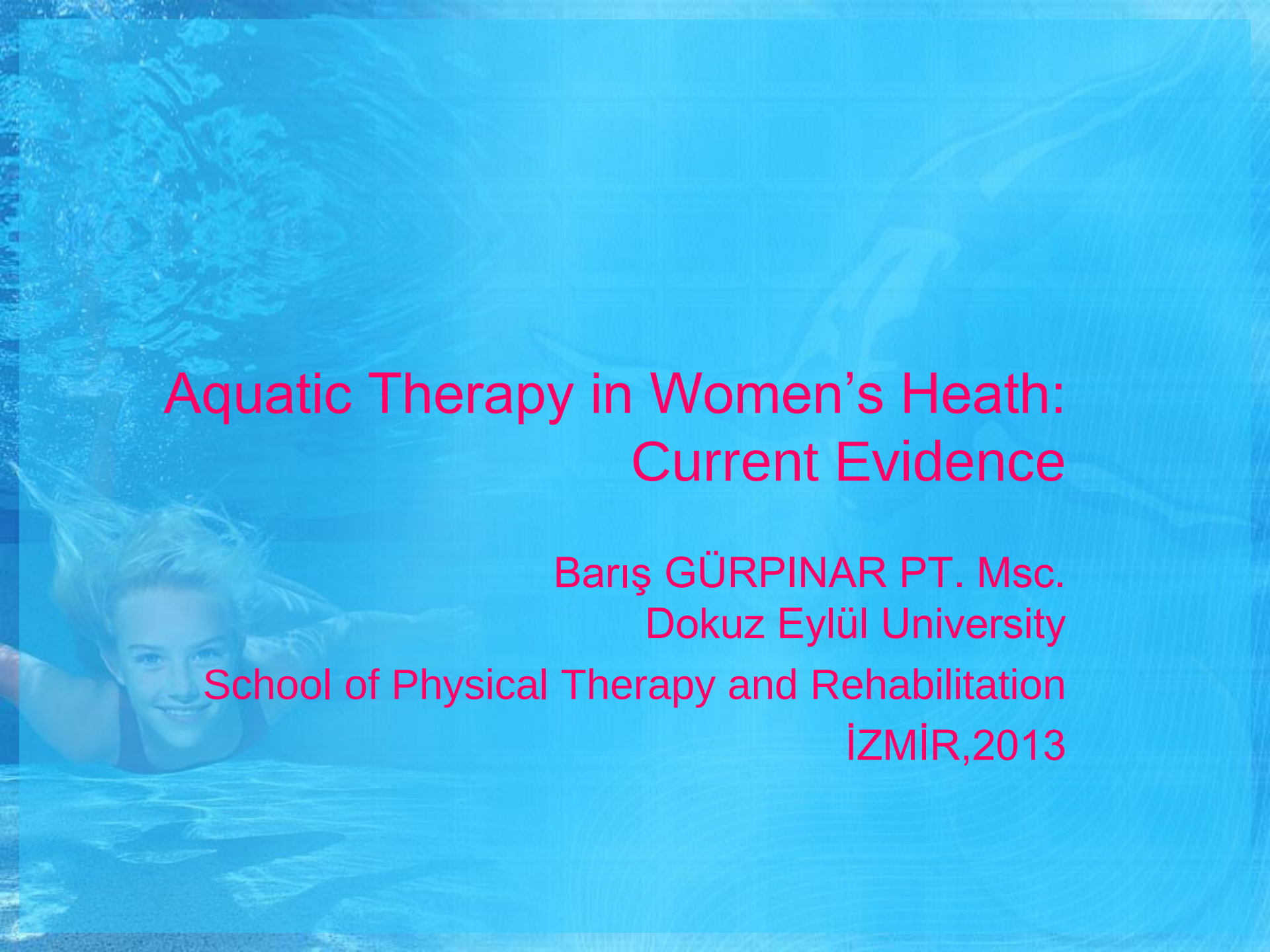


A woman with blonde hair is swimming underwater, smiling at the camera. Her arms are outstretched, and she appears to be in a relaxed, therapeutic pose. The water is clear and blue, with some bubbles visible around her head.

Aquatic Therapy in Women's Health: Current Evidence

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İZMİR, 2013

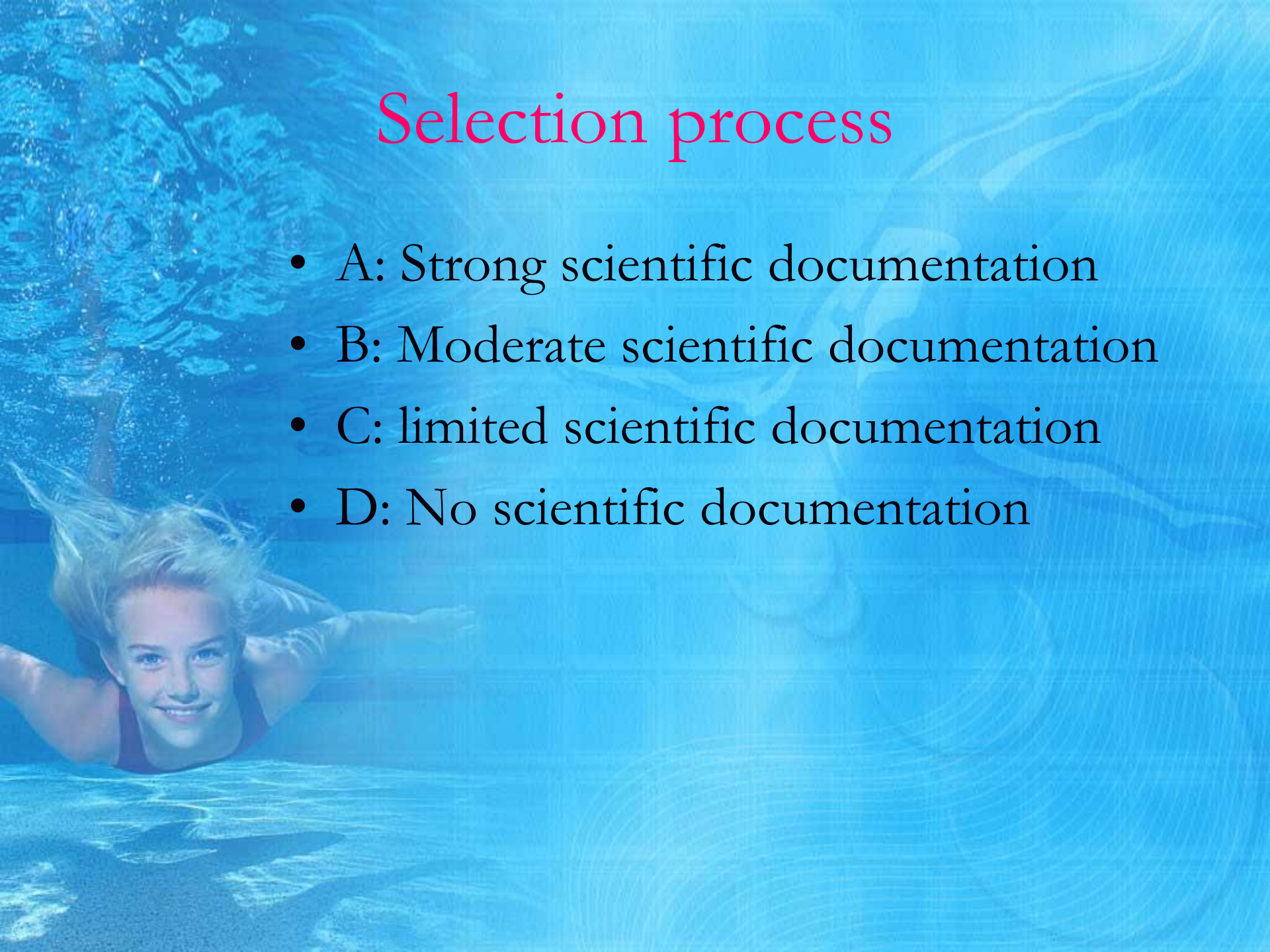
Key Words

- Woman/Women
- Girl
- Gynaecological
- Postnatal/ Prenatal
- Menopause / postmenopausal
- Labour
- Pelvic floor
- Menstrual/perimenustral/Menarche
- Eating disorder
- Osteoporosis
- Obesity
- Pregnancy
- Breast Cancer
- Cervix Cancer



Selection process

- A: Strong scientific documentation
- B: Moderate scientific documentation
- C: limited scientific documentation
- D: No scientific documentation

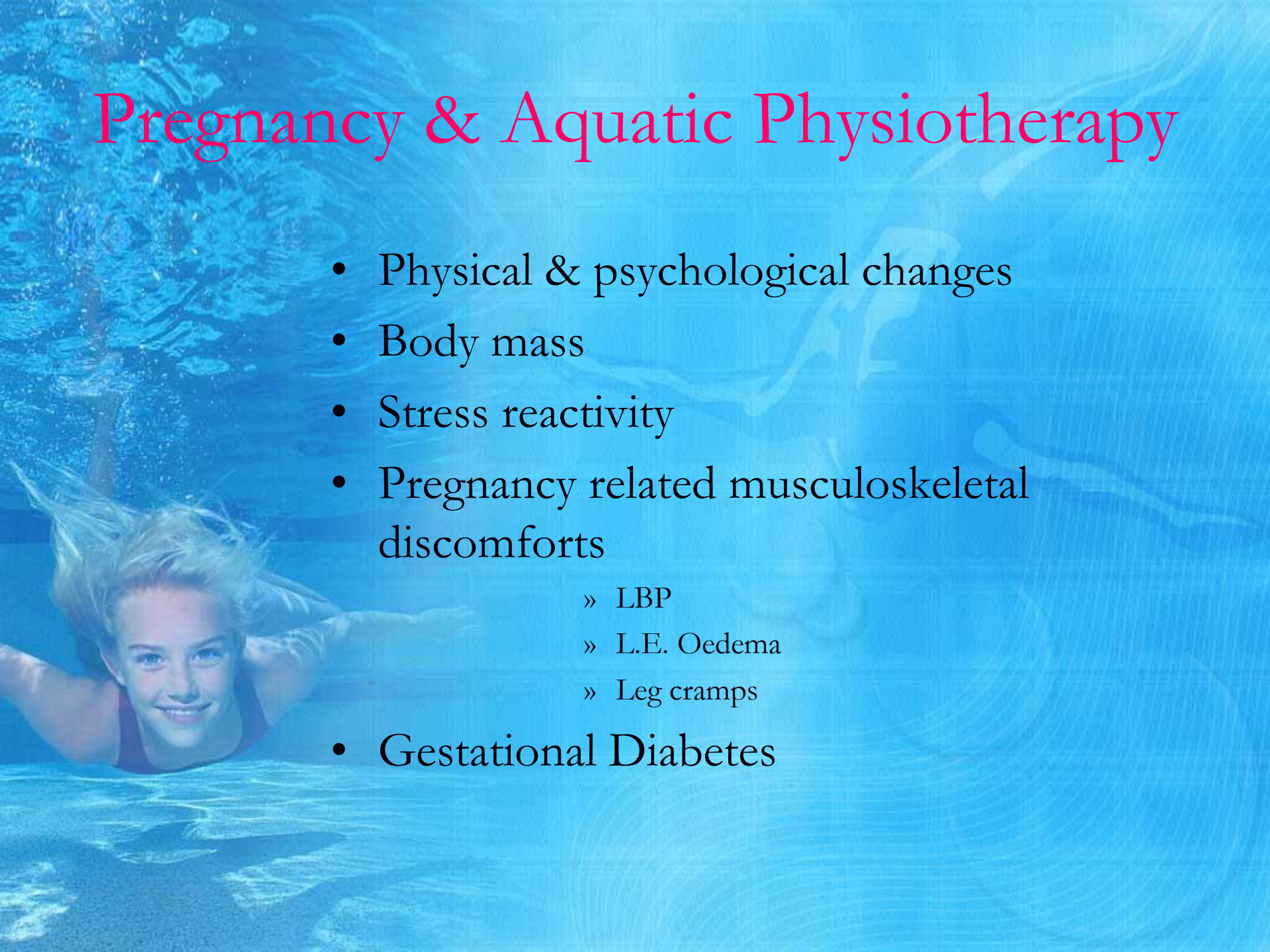


Pregnancy & Aquatic Physiotherapy



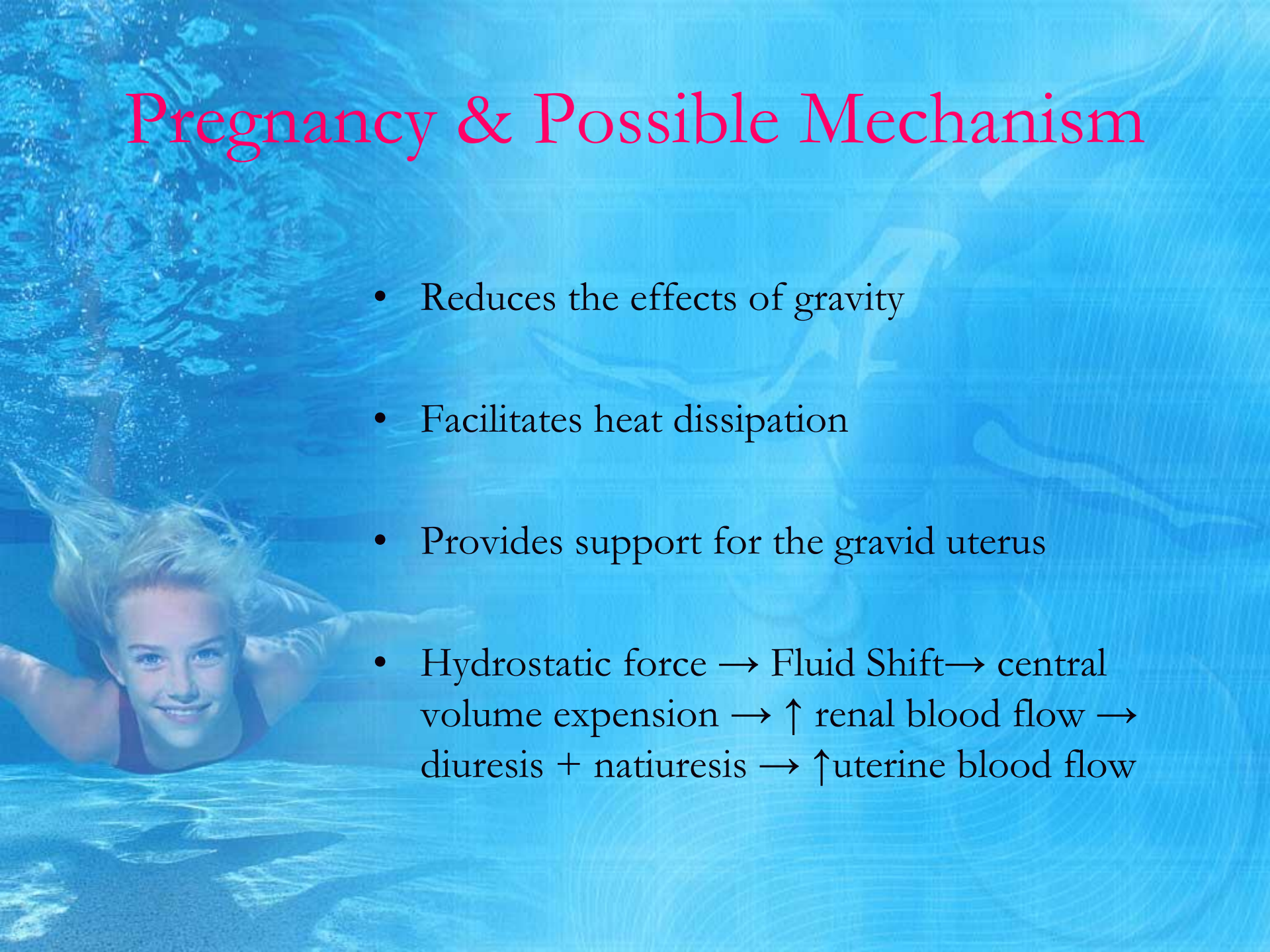
Pregnancy & Aquatic Physiotherapy

- Physical & psychological changes
- Body mass
- Stress reactivity
- Pregnancy related musculoskeletal discomforts
 - » LBP
 - » L.E. Oedema
 - » Leg cramps
- Gestational Diabetes



Pregnancy & Possible Mechanism

- Reduces the effects of gravity
- Facilitates heat dissipation
- Provides support for the gravid uterus
- Hydrostatic force → Fluid Shift → central volume expansion → ↑ renal blood flow → diuresis + natiuresis → ↑ uterine blood flow



Pregnancy & Evidence Level

	A	B	C	D
Anxiety/stress		✗		
Oedema		✗		
Back pain/LBP		✗		
Respiratory effect				✗
Renal effect			✗	
QoL			✗	
Gestational diabetes		✗		

Pregnancy & Evidence for Aqua Therapy

Water exercise may be an excellent choice of exercise during pregnancy (ACOG, 2002)

Pregnancy & Recommendation

- 20-35 week age
- 60% VO₂ max 40'-60'
- 3 dys/week



Pregnancy & Contraindication

- No hot tub before 20 weeks
- 32°C degree
- Submaximal exercise
- Supine lying



Labor & Birth



Labor & Birth

- Anxiety
- Pain
- Pharmacological agent usage
- Pelvic floor injury
- Caesarean section
- Labor comfort
- Dilatation



Labor & Birth Evidence for Aqua Therapy

- Ease painful contraction (Odent 1983, Brown 2001, Benfield 2002, Aird et al, 1997)
- ↑Enhance fetal rotation (Wanbach & Drap 1989)
- Encourage upright positions and movements that facilitate labor progress (Stark et al, 2008)
- Affects neuroendocrine responses that modify psychophysiological processes (Benfield et al, 2010)
- ↓Pharmacological agent usage (Cluett & Burns 2012)



	A	B	C	D
Anxiety			✗	
Pain		✗		
Pharmacological agent usage		✗		
Pelvic floor injury				✗
Caesarean section				
Labor comfort			✗	
Dilatation				✗

Labor & Birth & Possible Mechanism

- Freedom to move and change positions
- Warm water → muscle relaxation, ↓ anxiety + ↓ release of catecholamines + ↑ release of endorphins
- ↑ uterine perfusion, ↓ painful contractions → shorter labours and ↓ oxytocin augmentation



Labor & Birth & Contraindication

- Continuous fetal monitoring
- Vaginal bleeding
- Imminent birth



Osteoporosis & Aquatic Physiotherapy



Osteoporosis

- Menopause → Loss of bone density
- Fractures



Osteoporosis & Evidence for Aqua Therapy

- Prevents bone loss (Tsukahara, 1994, Ay 2000, Ay 2005, Roststein 2008)
- Reduce compressive loading (Bonnyman 2011)
- Has no effect (Bravo 1997)
- Improves balance (Smulders 2005, Shono 2000, Resende et al 2008, Leigh et al 2012)



Osteoporosis & Evidence for Aqua Therapy

	A	B	C	D
Prevents bone loss			✗	
Reduce falls	✗			

Osteoporosis & Evidence for Aqua Therapy

- 43 Water polo player, 26 swimmer 30 sedantary
17- 34 yrs, 52 ♂, 47 ♀
- Swimmers <control leg & total aBMD
- Water polo>control leg aBMD
- Water polo>control arm & trunk aBMD
- F swimmers > control arm BMC

Magos et al 2007 Clin J Sport Med 2007

Osteoporosis & Possible Mechanism

- Serum PTH levels ↓ and serum CT levels ↑??
- Muscle contraction → strains on bones??
- Insulin-like growth factor-1
- Viscosity → resistance, isokinetic exercise model
- Viscosity → greater physical activity
- increasing self-confidence
- !!!!Improve balance & reduce falls

Osteoporosis & Contraindication

- Not in general
- Avoid risk of fall



Obesity & Aquatic Physiotherapy



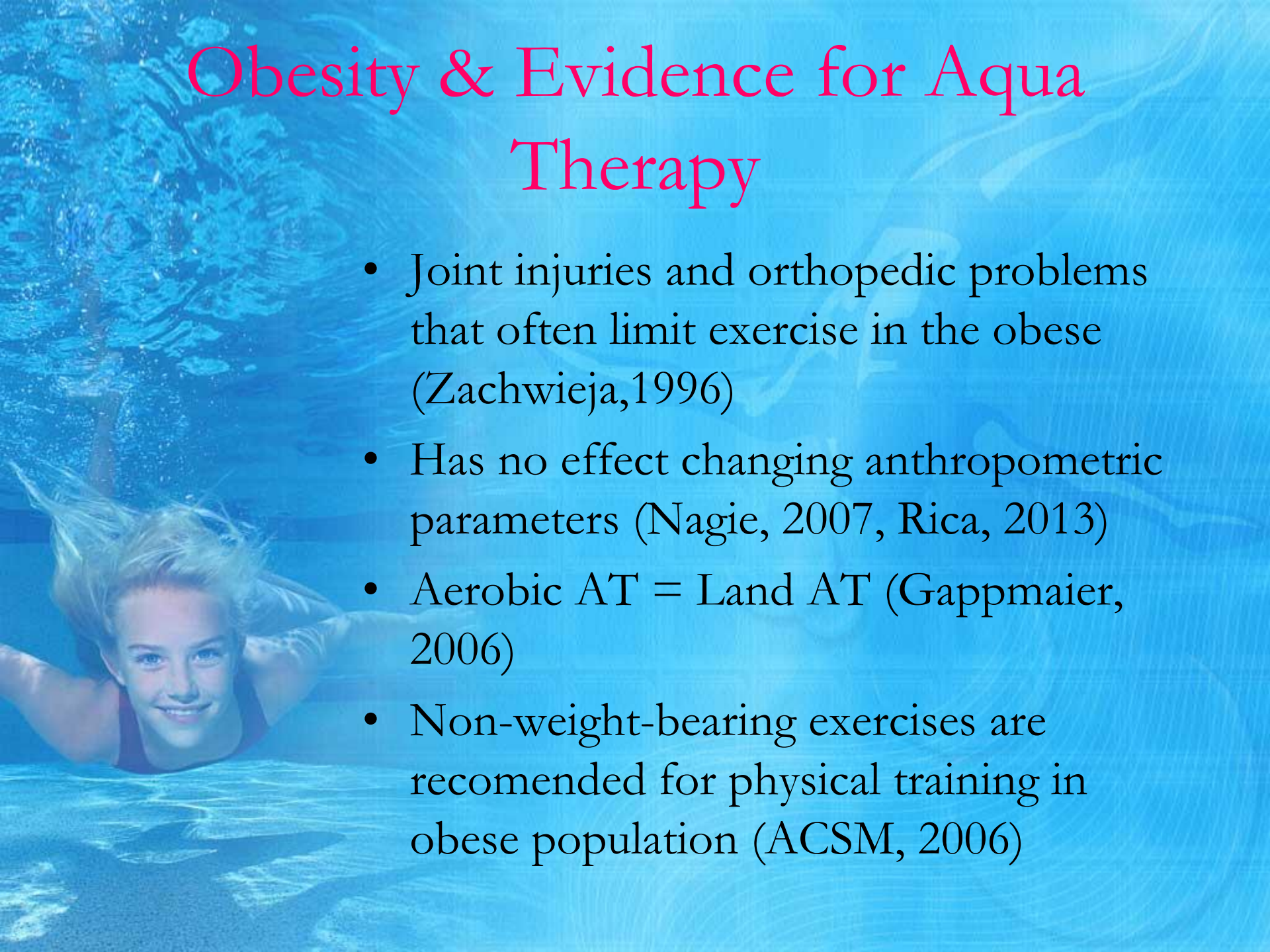
Obesity

- Women were more likely to be obese than men.
- Africa, Eastern Mediterranean and South East Asia, women had roughly double the obesity prevalence of men.

WHO, 2008

Obesity & Evidence for Aqua Therapy

- Joint injuries and orthopedic problems that often limit exercise in the obese (Zachwieja, 1996)
- Has no effect changing anthropometric parameters (Nagie, 2007, Rica, 2013)
- Aerobic AT = Land AT (Gappmaier, 2006)
- Non-weight-bearing exercises are recommended for physical training in obese population (ACSM, 2006)



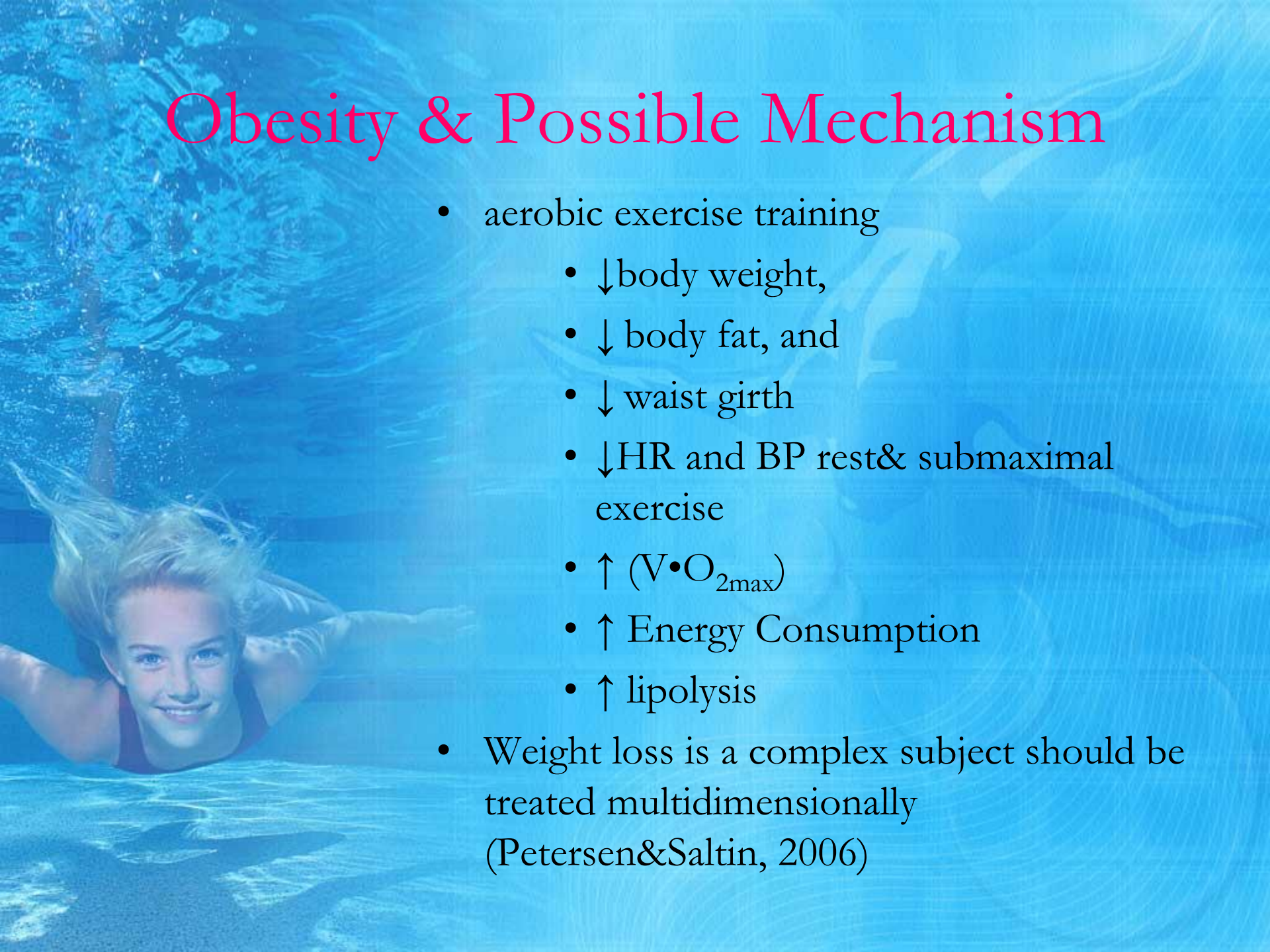
Obesity & Evidence for Aqua Therapy

4km/walking on treadmill	On land	In thigh deep water	In waist deep water	7 km/h Running on land
VO2(ml/min/kg)	9.84(SD 0.84)	20.16 (SD2.32)	17.48 (SD 2.47)	23.64 (SD 0.84)
HR (b/min)	78 (SD 10)	104 (SD 5)	96 (SD 5)	124 (SD 7)
Stride Frequency	101 (SD 6)	96(SD 7)	92(SD 10)	149 (SD 12)
VO2/ stride	0.10 (SD 0.01)	0.21 (SD 0.04)	0.19 (SD 0.04)	0.16(SD 0.03)

Pohi & Mc Naughton 2003

Obesity & Possible Mechanism

- aerobic exercise training
 - ↓ body weight,
 - ↓ body fat, and
 - ↓ waist girth
 - ↓ HR and BP rest & submaximal exercise
 - ↑ ($V \cdot O_{2\max}$)
 - ↑ Energy Consumption
 - ↑ lipolysis
- Weight loss is a complex subject should be treated multidimensionally (Petersen & Saltin, 2006)



Obesity & Contraindication

- Not in general
!!! Comorbidities



Anorexia nervosa



Anorexia nervosa

- Excessive physical activity
- Depression
- Osteoporosis



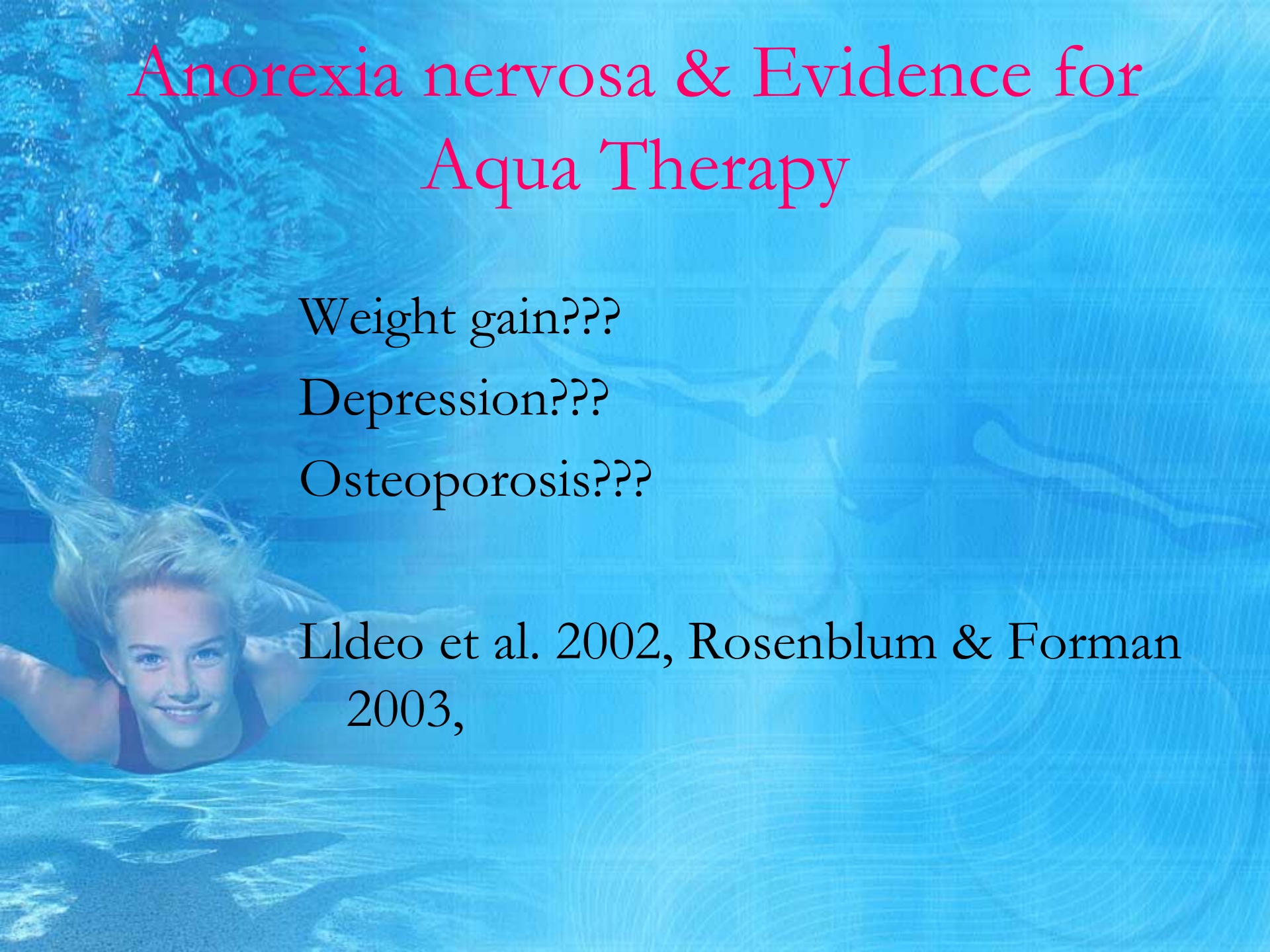
Anorexia nervosa & Evidence for Aqua Therapy

Weight gain???

Depression???

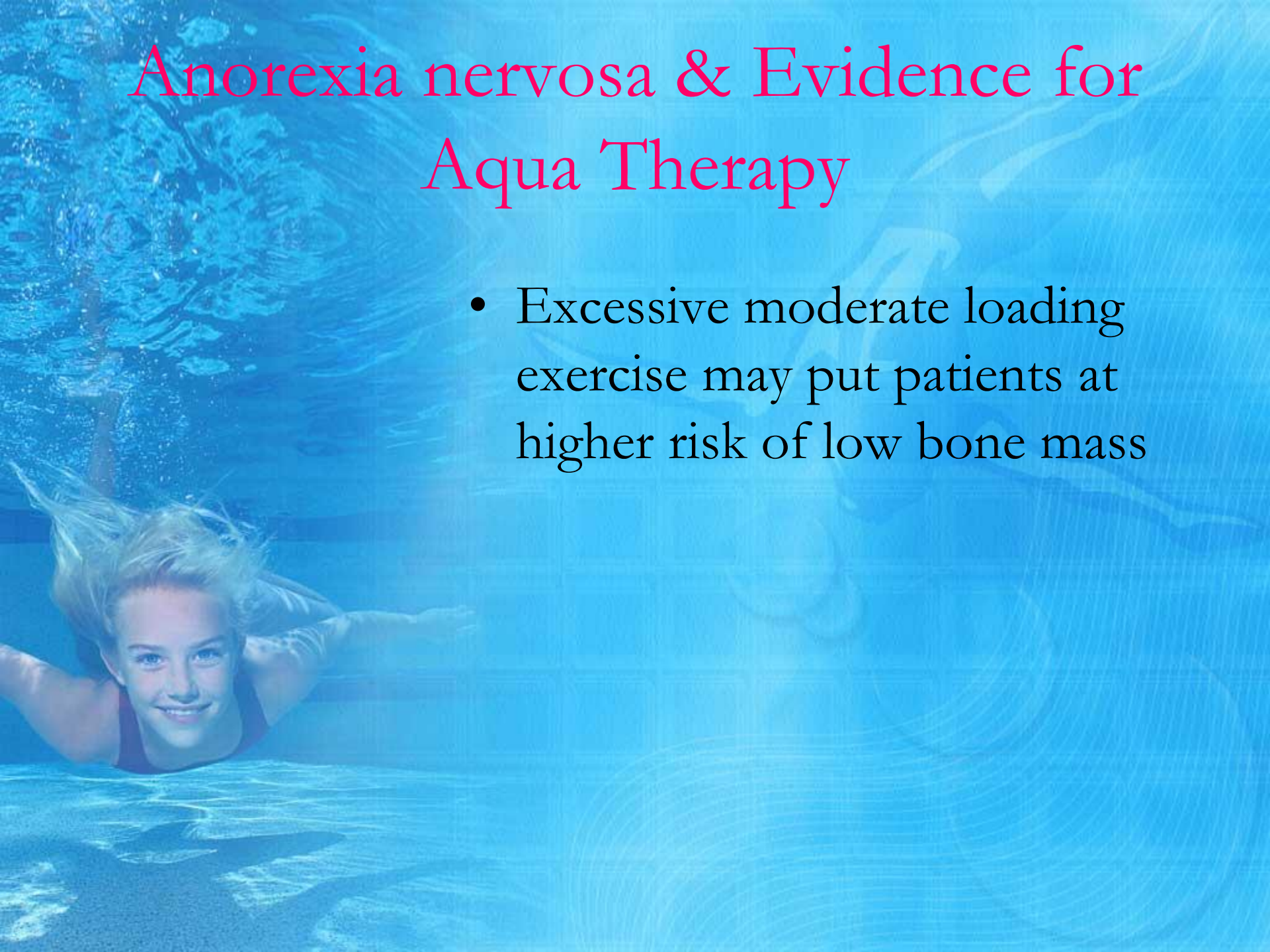
Osteoporosis???

Ildeio et al. 2002, Rosenblum & Forman
2003,



Anorexia nervosa & Evidence for Aqua Therapy

- Excessive moderate loading exercise may put patients at higher risk of low bone mass



Women Health & Aquatherapy

Conclusion



Thank you for your attention

