

THE COMPLETE GUIDE TO

Sarah Bolitho and Vicky Hatch

AQUA EXERCISE FOR
PREGNANCY AND
POSTNATAL HEALTH



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INTRODUCTION

The aim of this book is to review the benefits of water-based exercise during pregnancy and the postnatal period to provide a unique reference guide for fitness instructors or midwives who may be involved in prescribing exercise programmes for pre- or postnatal women. It is also suitable for aqua instructors who may encounter occasional pre- or postnatal women within their water-based activity sessions, or aqua instructors whose class participants become pregnant.

We hope this book will be a complete resource for any practitioner working with pre- and postnatal women in water. It is designed to support the National Occupational Standards for the Level 2 Certificate in Fitness Instructing (Water-Based Exercise) and the Level 3 Award in Adapting Activity for Antenatal and Postnatal Clients, and combines the knowledge of these two fitness modes. The inclusion of an extensive range of exercises and class formats makes this a valuable, user-friendly resource that can be referred to on an ongoing basis for information and ideas.

We recommend that anyone who intends to deliver aqua-natal sessions is either already qualified or undertakes a specific training course such as the Level 3 Award in Adapting Activity for Antenatal and Postnatal Clients, and the Level 2 Certificate in Fitness Instructing (Water-Based Exercise), both of which cover the relevant underpinning knowledge in more depth. Midwives who want to deliver water-based exercise to their patients are advised to work alongside a qualified



instructor or to gain the Level 2 Certificate in Fitness Instructing (Water-Based Exercise).

Aquatic training, or water-based exercise, is one of the most accessible exercise disciplines and can be adapted for all levels of fitness and ability. The resistance of the water supports the body and requires exercises to be performed at a slower speed, which makes water-based exercise sessions attractive and safe not only for those who are pregnant but also for beginners, older participants and for people carrying additional bodyweight.

Regular exercisers and non-exercising women may try water-based activity during pregnancy in order to stay healthy and mobile and to try to relieve some of the discomforts of pregnancy. Offering aqua-natal sessions means midwives, fitness instructors and swimming teachers who hold appropriate qualifications can support women with a 'normal' pregnancy who want to take up or maintain activity. As well as helping to manage any aches or pains they might be experiencing, this will also provide a wealth of health-related benefits for both mother and baby.

It is normal for a pregnant woman to be concerned about exercising and the potential risks to the pregnancy and her baby. However, research now suggests that moderate exercise, particularly exercise in water, is safe and may even be beneficial for maternal health and foetal outcome (Katz, 1996; Kihlstrand et al, 1999; Hartmann & Bung, 1999; Clapp, 2000; Lox, 2000; Parker & Smith,

2003; Smith & Michel, 2006; and 2003; NICE, 2007), thus more women may seek opportunities to participate in this type of activity during pregnancy.

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PART ONE

UNDERPINNING KNOWLEDGE

This section covers the underpinning knowledge that will help you to plan and deliver safe and effective water-based sessions for pregnant and postnatal women. [Chapter 1](#) reviews the benefits of exercise in pregnancy and looks at current levels of women who are active, both generally and during pregnancy. [Chapter 2](#) reviews the key anatomical and physiological changes of pregnancy and the postnatal period relevant to water-based exercise including cardiovascular, respiratory and musculoskeletal implications. [Chapter 3](#) considers the properties of water and how physiological changes, including increases in weight and body mass in pregnancy, affect participation in water-based exercise. [Chapter 4](#) looks at the benefits of water-based exercise in pregnancy and the postnatal period, and also covers the risks and contraindications to activity at this time.

ACTIVITY IN PREGNANCY

OVERVIEW OF ACTIVITY LEVELS IN PREGNANT WOMEN

It is a fact that the majority of women in the UK are inactive with only 29 per cent self-reporting that they meet the current recommendations for activity for health (see [Appendix 1](#)). When accelerometers, devices that measure movement accurately, were used to measure activity, the figure dropped to around 4 per cent of women who were active enough to gain health benefits. The figures for pregnant women are equally low, as only 23 per cent self-report being active at or above the recommended levels in the past month. This low level of activity may be linked to the rising levels of obesity and being overweight in adult women in the UK; currently an estimated 32 per cent of women are classified as overweight and 26.1 per cent as obese – meaning around 58 per cent of adult women in the UK are over the recommended weight guidelines (Public Health England, UK Prevalance and Trends, 2013).

PREGNANCY AND OBESITY

Just as with women in general, rates of being overweight or obese in women of childbearing

age are rising. Nearly half of women of childbearing age in the UK are overweight or obese, with an estimated 22 per cent obese and, as maternal obesity carries significant risks for both maternal and foetal health, this is a major concern. Women may be overweight or obese prior to becoming pregnant, or may gain excess weight during pregnancy ('eating for two'). Whichever is the case, excess maternal weight may linger after delivery and might not be lost before the next pregnancy, during which more weight may be gained, and not lost, creating a cycle of pregnancy and weight gain.

While avoidance of obesity is not the only reason for being active during pregnancy, it is a key one as not only are the risks of pregnancy complications increased, but also the risk of morbidity and mortality of both mother and foetus/baby when maternal obesity exists. In fact, the UK Confidential Enquiry into Maternal and Child Health (CEMACH, 2007) identifies obesity as the fastest growing cause of women dying in pregnancy or childbirth in the UK. Information available shows that more than half of deaths from indirect or direct causes in pregnancy were in women who were overweight or obese, with 15 per cent having a BMI of greater than 40.

PATTERNS AND DETERMINANTS OF ACTIVITY IN PREGNANCY

With fewer than 30 per cent of adult women meeting the activity guidelines for health, it is perhaps not surprising that activity levels in pregnant women are also low. Moreover, participation in activity on a regular basis was particularly low (Gaston & Cramp, 2011; Haakstad et al, 2009). Research indicates that while over half of the pregnant women surveyed stated that they had done moderate to vigorous household or leisure activity in the past month, fewer than 25 per cent actually met the guidelines for activity throughout their pregnancy (Evenson & Wen, 2010). Rates of activity post-partum are also low, with less than one-third of women meeting the guidelines (Durham et al, 2011). It is also indicated that activity levels tend to be much higher in the first trimester than in the second or third trimesters and that women from a white ethnic group are more likely to be active than those from other ethnic backgrounds. Add in the fact that over 15 per cent were watching over five hours of television a day and risks from inactivity start to add up.

A review of patterns and determinants of exercise during pregnancy (Gaston & Cramp, 2011) indicates that pregnant women are generally less active than non-pregnant women and that physical activity decreases during pregnancy. Predictors of higher exercise participation were being previously active, being from a white ethnic group, pregnant with their first child, and higher income and education levels. The Danish National Birth Cohort (Juhl et al, 2012) indicates that regular exercise participation during pregnancy is linked to a number of correlates, i.e. things that have an effect on or depend on another variable. Older age,

being a student or unemployed, eating a healthy diet, moderate alcohol consumption and eating disorders were correlated with exercising more than three times per week. On the other hand, multiparity (carrying two or more foetuses, or in a second or subsequent pregnancy), normal or lower rated health, smoking and a poor diet were the strongest predictors of not exercising. Interestingly women aged over 25 who had metabolic or psychiatric disorders or had received fertility treatment were more likely to show increased activity levels from early to late pregnancy.

As has been discussed, activity is relatively low in pregnancy and appears to peak in the first trimester, reducing in second and third trimesters. Activity patterns pre-pregnancy appear to be linked to ongoing activity during pregnancy (Haakstad et al, 2009) and those women who were overweight or obese before pregnancy were less likely to be active during pregnancy, with less than 11 per cent of women defined as regular exercisers by the third trimester. This fall in activity levels was linked to high weight gain during pregnancy as well as being overweight or obese prior to conception. Another study found that prior to pregnancy around 46 per cent of women were active but this reduced to 28 per cent in week 17 and just over 20 per cent by the thirtieth week. However, the number of women swimming actually increased up to the thirtieth week of pregnancy (Owe et al, 2009).

It may be that pregnancy in itself is an event that leads to decreased participation in physical activity as most women reduce their activity in the first 20 weeks (Fell et al, 2009). This may be an issue that can be addressed within health care provision, since research indicates that there is little awareness among pregnant women of the

benefits of activity for the baby and midwives are ideally placed to provide this information (Weir et al, 2010). Furthermore, a survey carried out jointly by the Royal College of Midwives and NetMums in 2010 found that nearly two-thirds of women (61 per cent) felt that their midwife did not have time to talk about weight management, so perhaps one of the barriers to activity is a lack of informed and trusted information and advice. A safe, effective and enjoyable aqua-natal session, run by a trained health care or fitness professional, is an ideal forum for education about starting or maintaining an active and healthy pregnancy.

KEY BENEFITS OF ACTIVITY IN PREGNANCY

There are many benefits in being active for all women, and these are just as important, if not more so, for pregnant women. The benefits of regular exercise and daily physical activity are well documented and include improved cardiovascular fitness, muscular strength and endurance,

maintenance or improvement of bone mineral density, better posture, reduced backache or back-pain, weight maintenance, mental health benefits, better ability to cope with stress, reduced risk factors for certain diseases and better management of medical conditions. There are additional benefits for both mother and baby to be gained from being active in pregnancy. These are discussed further in [Chapter 2](#) and include:

- Better pregnancy posture
- Increased self-confidence
- Better circulation
- Maintenance of bone density
- Social aspect
- Control of weight gain
- Reduced pregnancy-associated long-term memory impairment
- Quicker postnatal recovery
- Less fat on baby
- Improved ability to cope with the stress of delivery (baby and mother)
- Improved ability to self-soothe (baby)

PREGNANCY AND THE IMPLICATIONS FOR AQUA EXERCISE

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THE TIMELINE OF PREGNANCY

The following overview of the timeline of pregnancy shows the effects on the body during each trimester.

Table 2.1 The pregnancy timeline

Trimester one	
Conception	
Missed period	Often the first sign, but with increased accuracy of tests, pregnancy may be detected before a period is missed
Nausea/sickness	So called 'morning' sickness may make an unwelcome appearance and sense of taste and smell may alter
Breast tenderness	Breasts may be tender or painful within a couple of weeks of conception so a good bra is essential even at this stage
Urination	Hormones and relaxation of smooth muscle tissue in the bladder can cause increased frequency of urination
Tiredness and fainting	The many changes occurring in the body can cause dizziness, tiredness and fatigue
Joints	Relaxin is being released so joints may start to feel unstable
Mood	Fluctuating hormone levels can cause mood swings and this can be an anxious time while parents wait for the first scan

Table 2.1 The pregnancy timeline (cont.)

Trimester two	
Nausea	This will diminish in most women around 13–16 weeks, but may continue longer for some
Mood	Feelings of well-being and good health are common now
Joints	Instability may affect balance and range of movement and the larger abdomen may cause lordosis leading to backache
Supine hypotensive syndrome	When lying on the back the weight of the uterus can cause pressure on the vena cava compromising venous return to the heart, causing dizziness or nausea
The abdomen	As the foetus grows the uterus expands out of the pelvis and into the abdominal cavity
Breathing	Breathlessness is likely at this stage
Trimester three	
The abdomen	Now much larger, making breathing, eating and sleeping uncomfortable and making some movements awkward
Tiredness	This may be increasing as the body becomes heavier and may affect everyday activities
Balance	Balance may be affected by the change in centre of gravity
Joints	Unstable joints and poor posture can lead to aches and pains
Oedema	Fluid retention causes swelling, usually in wrists, hands and ankles
Breathing	The reduced space for the lungs causes breathlessness
Urination	By the end of trimester three the bladder will be under pressure from the foetus, making urination more frequent and urgent
Alertness	The so-called ‘baby brain’ may be evident now!
Anxiety	Fear of delivery and worry about looking after a new baby may cause anxiety
Breasts	Likely to be heavy, tender and possibly leaking milk

THE PHYSIOLOGICAL EFFECTS OF PREGNANCY

This section provides a brief summary of the key effects of pregnancy on the body. It is not intended to provide a comprehensive review of

how pregnancy affects physiology; for instructors who want to understand the effects of pregnancy on the body and mind we recommend further reading or training to support this book.

Table 2.2 Overview of the key effects of pregnancy

System	1st trimester	2nd trimester	3rd trimester
Cardiovascular	<ul style="list-style-type: none"> • Increase in resting heart rate (about 5–10 bpm) • Increase in blood volume starts • Vascular underfill may occur 	<ul style="list-style-type: none"> • Venous return impaired causing dizziness • Blood volume now stabilised and blood pressure returns to normal 	<ul style="list-style-type: none"> • Possible gestational hypertension • Risk of pre-eclampsia
Respiratory	<ul style="list-style-type: none"> • More sensitive to carbon dioxide • Increase in breathing rate • Tiredness and breathlessness may occur with any increases in activity 	<ul style="list-style-type: none"> • Reduced space for lung expansion may lead to breathlessness with normal activity levels 	<ul style="list-style-type: none"> • Breathing shallow due to limited space for lung expansion • Breathlessness may occur at low levels of exertion
Musculoskeletal	<ul style="list-style-type: none"> • The hormone relaxin is released which allows ligaments to stretch 	<ul style="list-style-type: none"> • Increased kyphotic posture due to weight of breasts • Increased lumbar lordosis • Backache is common due to postural changes 	<ul style="list-style-type: none"> • Effects of relaxin are at a peak now • Posture continues to be a problem and can exacerbate existing problems • Pelvis may become unstable • Pelvic girdle pain may occur
Urinary	<ul style="list-style-type: none"> • Hormones and increased progesterone can cause increased micturition (urination) and inability to fully empty bladder • Risk of urinary tract infection (UTI) due to incomplete emptying 	<ul style="list-style-type: none"> • Pressure on pelvic floor can lead to incontinence 	<ul style="list-style-type: none"> • Increased need to urinate can occur due to pressure on the bladder

Table 2.2 Overview of the key effects of pregnancy (cont.)

Metabolic	<ul style="list-style-type: none"> • Increase in metabolic rate • Average healthy weight gain is 1–3 kg • No need for extra calories yet 	<ul style="list-style-type: none"> • Risk of gestational diabetes • Average healthy weight gain is 6–8 kg • Need additional 300 kcal per day 	<ul style="list-style-type: none"> • Risk of gestational diabetes • Average healthy weight gain is about 3–4 kg • Keep to 300 kcal per day extra intake
Gastrointestinal	<ul style="list-style-type: none"> • Nausea and sickness often occur • The intestinal tract relaxes 	<ul style="list-style-type: none"> • Indigestion and heartburn common 	<ul style="list-style-type: none"> • Constipation, indigestion and heartburn common • Piles may develop
Other	<ul style="list-style-type: none"> • Body temperature increases • The breasts and the uterus start to enlarge 	<ul style="list-style-type: none"> • Hormones stabilise • Bleeding gums • A dark vertical line on the abdomen (linea negra) appears • Reactions slower 	<ul style="list-style-type: none"> • Braxton Hicks contractions felt • Breasts enlarge and may leak • Sleep may be disrupted • Carpal tunnel syndrome • Swelling common (oedema) • Leg cramps can occur
Psychological	<ul style="list-style-type: none"> • Anxiety 	<ul style="list-style-type: none"> • Mood improves 	<ul style="list-style-type: none"> • Anxiety • Fear of birth

THE ENDOCRINE SYSTEM AND HORMONES OF PREGNANCY

There are a range of hormones that have specific effects on the body during pregnancy. The three key ones are oestrogen, progesterone and relaxin.

Oestrogen

Oestrogen is always present in women and men, although women have much higher levels. During pregnancy, oestrogen levels rise by 20–30 times, as its key function is to promote growth of the baby. It also promotes growth of the uterus, which increases about 20 times in size from the size of a fist to the size of a large watermelon.

Additional effects are on the breasts which grow to facilitate milk production, and the heart which enlarges to cope with the additional demands of pregnancy. Another effect of oestrogen is on tissue growth and this can lead to fluid retention and oedema (swelling).

Progesterone

During pregnancy, blood volume increases by up to 50 per cent to cope with the demands of the body and the growing foetus. One of the most important effects of progesterone in pregnancy is to relax smooth muscle tissue to cope with this extra volume and prevent hypertension. However,