Understanding the role of exercise in health promotion

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An inactive lifestyle is associated with poor health. Exercise is an important part of preventative strategies for many chronic conditions. This guided reflection article examines evidence on the role of exercise in preventing weight gain, osteoporosis, diabetes, cardiovascular disease and mental health problems. It aims to enable nurses to make informed recommendations to their patients about the ways in which appropriate exercise can bring health-related benefits.

Exercise is an important part of preventative strategies for many chronic conditions. However, often the people who need exercise the most do not exercise at all and attribute their inactivity to their medical problems.

This week’s guided reflection article identifies the risks associated with inactivity and the benefits of exercise in improving health and preventing disease.

It is important for nurses to understand these risks and benefits so that they are able to make informed recommendations to their patients about how appropriate exercise can bring health-related benefits.

Risks of inactivity

Inactivity is associated with an increased risk of cardiovascular disease and poor health (Gillum, 1996).

Common problems that can contribute to an inactive lifestyle include:

- Lack of time;
- Insufficient social/financial support;
- Disrupted routines;
- Bad weather;
- Lack of access to exercise facilities;
- A simple dislike of exercise.

Advances in technology are also systematically removing physical exertion from our daily lives, with transport, TV remote controls, escalators and lifts all serving as labour-saving devices.

In 1992 the Allied Dunbar National Fitness Survey (Sports Council/Health Education Authority, 1992) found that approximately 74 per cent of men and 68 per cent of women were below the activity threshold required for health-related benefits. Since this survey the incidence and severity of obesity and health-related diseases has further increased and inactivity is now one of the most prevalent risk factors for cardiovascular disease in the UK.

Physical inactivity is also acknowledged to be a significant and preventable risk factor for:

- Obesity;
- Type 2 diabetes;
- Osteoporosis.

The long-term expense of treating these diseases puts considerable strain on the NHS.

Benefits of exercise

Regular exercise also helps to prevent weight gain and plays a part in increasing personal well-being by reducing stress, anxiety and depression (Stear, 2003). The most cost-effective strategy to improve public health is therefore to promote exercise and to recommend regular physical activity.

Weight control

Obesity is characterised by excess adipose tissue, which can be identified by an increase in body weight or body mass index (BMI).

However, body weight and BMI are not in themselves an accurate measure of obesity. Analysis of body composition gives a more accurate measurement of fat and lean tissue, which can vary among individuals with the same body weight. However, in clinical settings weight is the easiest variable to measure and in the majority of studies it is the only measure of obesity given.

Exercise increases energy expenditure and therefore should theoretically result in significant weight loss. However, in studies that prescribe exercise as the only treatment for obesity only modest weight loss is observed and the effects can take at least nine months to become evident (Kirk, 2003).

When increasing activity levels, a negative energy
balance must be achieved for weight loss to occur. When prescribing exercise it is therefore essential to ensure that energy expenditure completely compensates for caloric energy intake. For significant weight loss an individual needs to exercise 3–5 times per week for at least 45–60 minutes, at an intensity of 60–70 per cent of that person’s maximum heart rate (calculated as 220 minus their age in years).

However, for sedentary individuals this prescription is too demanding and drop-out rates are high. Strategies must be employed to ensure that patients are eased into exercise programmes in order to increase adherence. For those who have led previously sedentary lifestyles, moderate intensity exercise is suitable for effective weight management, preventing weight gain and producing weight loss in young adults (Donnelly, 2003).

Modifications to diet, activity and attitude that enhance a person’s weight loss should be encouraged. This type of intervention allows skills to be developed (Box 1) to help lose/regulate weight (Wadden, 2003).

Muscular strength
Resistance exercise consists of activities that overload muscle. Examples include weight training, exercises against body weight and exercises in water.

Resistance training for three days per week has been shown to increase basal metabolic rate (BMR) and muscular strength (Dolezal, 1998). Increased muscular strength helps maintain mobility of joints and can help to improve and/or maintain posture that can deteriorate with a sedentary lifestyle.

An increased BMR indicates improved lean tissue composition and will facilitate weight loss and serve to maintain desired weight when this has been achieved.

Osteoporosis
Osteoporosis is a major public health concern that affects millions of people worldwide (Cooper, 1992), with associated health care costs growing in response to the increase in older populations. The most cost-effective way to address osteoporosis is prevention.

Bones, like muscle, respond to stress by becoming bigger and stronger. Regular physical activity places stress on the body and helps to stimulate bone growth, preserve bone mass and increase bone mineral density.

Physical activity undertaken early in life can contribute to higher peak bone mass. Both peak bone mass and bone mineral maintenance are affected by the combination of mechanical stress, body composition, nutrition and bone metabolism (Ming Chan, 2003).

Activities such as weightlifting, hiking, step aerobics, dancing and any activity that requires muscles to work against gravity, without putting too much stress on the joints, are beneficial as they help both to build and conserve bone mass.

Tai chi is an excellent example of a physical activity that can help prevent osteoporosis and its associated injuries. Its focus on posture and low velocity movements reduces loading on the joints, particularly the knees and the ankles, which are common sites of tissue and cartilage deterioration (Wolf, 1996). In addition to increasing bone density, regular exercise and tai chi have the benefit of enhancing coordination, balance, flexibility, muscle strength and postural stability, all of which contribute to decreasing the risk of falls.

Insulin resistance and diabetes
Diabetes is a disorder of carbohydrate metabolism and is characterised by high blood sugar levels and the presence of sugar in the urine. Hyperglycaemia causes the glycation of tissues and chronically this can lead to tissue damage. People who have diabetes are at much higher risk of developing coronary artery disease and cardiovascular disease and exercise is therefore vital for the prevention of these conditions.

Exercise can also improve glycaemic control in patients with impaired glucose tolerance and type 2 diabetes. A combination of acute transient changes associated with transient bouts (Yu, 2001) can accumulate into long-term training adaptation (O’Gorman, 2000). The effect is due to numerous changes including increased exposure of insulin to target cells, an increase in GLUT-4 transporter

**REFERENCES**


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**BOX 1. SKILLS THAT ENABLE WEIGHT CONTROL**

- Low-fat diet
- High-activity lifestyle
- Realistic expectations

**BOX 2. POLICY FOR EXERCISE PROMOTION**

SAVING LIVES: OUR HEALTHIER NATION (DoH, 1999)
- Suggests the development of a sports strategy that includes exercise prescription schemes

THE NATIONAL SERVICE FRAMEWORK FOR CORONARY HEART DISEASE (DoH, 2000)
- Recognises the role of exercise in reducing cardiovascular disease risk and reducing blood pressure

THE NATIONAL SERVICE FRAMEWORK FOR MENTAL HEALTH (DoH, 1999)
- Refers to evidence for exercise in reducing stress, increasing natural endorphins and reducing feelings of social isolation

THE NATIONAL SERVICE FRAMEWORK FOR OLDER PEOPLE (DoH, 2001)
- Mentions the benefits of exercise for bone strength, muscle mass and balance, which are important factors in falls prevention

THE NATIONAL SERVICE FRAMEWORK FOR DIABETES (DoH, 2002)
- Identifies the effects of regular exercise in the prevention of type 2 diabetes

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levels (responsible for transport of glucose into the cells), translocation of GLUT-4 from the cytosol into the cell membrane and an increase in enzymes of glucose storage and oxidation.

**Improved cardiac fitness**

Heart rate and blood pressure are both good measures of cardiac and vascular health. Resting heart rate (bpm) is an effective, non-invasive assessment of cardiovascular fitness and also allows adaptation to aerobic training to be measured. An appropriately designed 12-week endurance-training programme has been shown to decrease resting and submaximal heart rates in both young and mature adults (Cartez, 2003).

Being low in fitness carries a 52 per cent increased risk of developing hypertension (Blair et al., 1994). Dynamic aerobic training has a hypotensive effect, evident by decreasing both systolic and diastolic blood pressure (mmHg) in hypertensive individuals. Resistance training is not to be recommended due to the marked pressor blood pressure response (Bouchard, 1994). Cardiorespiratory fitness can be maintained and/or improved with regular physical activity (Cheng, 2003). Moderate and high levels of cardiorespiratory fitness are associated with a lower risk of stroke mortality in men (Blair, 2002).

**Improved cholesterol levels**

Endurance exercise training consisting of 15–20 miles per week of brisk walking or jogging, which accounts for 1,200–2,200kcal of energy expenditure per week, is associated with reductions in low-density lipoprotein (LDL-C) and increases in high-density lipoprotein (HDL-C). However, exercise almost never alters total cholesterol and LDL-C unless accompanied by a reduction in dietary fat intake and loss of body weight (Durstine, 2002).

**Psychological well-being**

In addition to the physiological benefits, regular physical activity has been reported to improve general psychological well-being. Exercise in combination with moderate energy restriction over 12 weeks resulted in improvements in obese patients (Nieman, 2000; Cramer, 1991). Improved psychological well-being gives previously sedentary people the confidence to continue exercising while minimising feelings of depression and anxiety, which can be the cause or result of an inactive lifestyle.

**Nursing implications**

As part of the holistic health assessment, nurses should ask their patients questions about the amount, type and frequency of the exercise they undertake. With a good understanding of the specific benefits for particular conditions they can then make recommendations for lifestyle changes that are relevant to their patients. The role of exercise in health promotion supports several national policies (Box 2, p37).

Physical activity should consist of dynamic rhythmic contractions of large muscle groups that transport the body over distance or against gravity. For optimal health benefits such activities should be performed at least every other day for an approximate duration of 30 minutes or until 200–400 kcal are expended (Taskell 2001). Examples of such exercises include walking, jogging, swimming and cycling.

In practice the prescription of exercise should predominantly focus on ensuring adherence to regular activity. To do this patients should be encouraged to participate in any activities they enjoy so that the exercise is seen as fun rather than an obligation.

To prescribe sedentary individuals 30–60 minutes of aerobic activity is unrealistic and the drop-out rate will be high. Instead, activity times can be achieved by accumulating multiple short bouts of exercise of 10 minutes in duration. Alternatively, exercise times should be built up slowly to reach recommended levels. For example, begin exercising for 10 minutes or less and when the patient feels comfortable increase the exercise duration to 10 minutes, then 12 and so on until the desired recommended times are achieved.

Exercise in water such as swimming and/or hydro classes are excellent activities that provide a cardiovascular or resistance workout while supporting the body weight. Low impact on the joints and minimal risk of falls, makes water-based activities ideal for older people or for those with osteoporosis whose bones are more frail and susceptible to fracture.

**Conclusion**

When recommending exercise, general guidelines should be given. However, it is essential to remember that all patients are different. Patients will have varying environmental demands, stresses and commitments, and these should be considered when advising on which activities an individual should adopt.

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**REFERENCES**