GIFT هدية

BODY IMAGE, SELF-ESTEEM, BODY COMPOSITION AND EXERCISE: A STUDY OF BAHRAINI WOMEN



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ABSTRACT

A two phase study was conducted to investigate: firstly, body image, body composition, self-esteem, and social aspects of the bodies of older and younger Bahraini women; and secondly, the effects of an exercise programme on a group of Bahraini women. The perceptions of male significant others were also explored. Body image was measured by: (a) the Body Cathexis Scale (BCS), (b) the Nine Figure Silhouette Scale, and (c) perception of the current and ideal body mass. Body composition was measured by anthropometric measurement techniques. Self-esteem was measured by: (a) the Adult Form of Self-esteem Inventories, and (b) the Physical Self Perception Profile (PSPP) and the Perceived Importance Profile (PIP). Social aspects of the body were measured by two constructed questionnaires.

The results of the first phase indicated that there were significant differences between the older and the younger women in all body composition measurements. The values of percentage body fat of the two groups indicated obesity (> 35%), although the majority of the women were not aware that they were obese. Those women were shown to be dissatisfied with their body mass and wanted to be significantly lighter than their current body mass. Body cathexis scores correlated negatively and significantly ($P < 0.05$) with percentage body fat in the younger women ($r = - 0.39$), and with body mass ($r = - 0.45$), BMI ($r = - 0.39$), fat mass ($r = - 0.42$), and fat free mass ($r = - 0.42$) in the older women. This indicates that those women who were heavier and fatter were less satisfied with their body parts and functions. Both groups idealised a thinner figure than their own, with the older women tending to idealise a much thinner figure than their younger counterparts.

The male groups were shown to be dissatisfied with their wives' bodies, with their ideal female figure significantly thinner than their perceived wives' figures.

Self-esteem scores indicated that for the younger women only, global self-esteem correlated significantly with physical self worth of the PSPP ($P < 0.05$);

physical self worth correlated significantly with the condition subdomain of the PSPP ($P < 0.001$) and the body subdomain ($P < 0.05$). For the older women, it is suggested that there is a missing link between global self-esteem and physical self worth, possibly related to health issues.

In conclusion, this phase indicated that like Western women, younger and older Bahraini women were dissatisfied with their weight and figures, and their percentage body fat indicated that they were obese.

Phase II of the study investigated the effects of exercise programme on body image, body composition, self-esteem, and physical fitness. Body image, body composition, and self-esteem were measured by the same instruments used in phase I. Physical fitness was measured by the YMCA fitness test battery, including: cardio-respiratory endurance (predicted Vo_2 max), muscular endurance (sit ups and bench press), and flexibility (sit and reach test). The exercise programme consisted of three months aerobic exercise (walking/jogging), and other forms of exercises to enhance muscular endurance and flexibility. The women were measured before, during, and after the exercise programme.

ANOVA for repeated measures indicated significant improvements in most of the body composition measurements. Post exercise measurements compared to pre exercise measurements indicated a reduction of about 3 kg in body mass, 1% in body fat, 2.1 kg in fat mass, and 0.9 kg in fat free mass. All these changes are in agreement with that reported in the literature, except that of fat free mass. The results also indicated improvements in physical fitness status of the subjects, which was significant for the cardiorespiratory endurance test, muscular endurance (sit ups test), and flexibility.

The effects of exercise on psychological parameters were evident only in those specific to the body. The women's perceptions of their body attractiveness (measured by the PSPP) improved significantly. They were shown to be less dissatisfied with their weight, waist, and profile items of the BCS. There were significant changes in the way the women perceived their own figures, and the way they idealised a female figure. The distance

between their current figures and their ideal figure became smaller, indicating that they became more realistic in their ideal.

Exercise also appeared to have a significant effect on the husbands' perceptions of their wives' current figure, which became thinner, whilst they showed a tendency to idealise a fatter woman.

Global self-esteem and total body cathexis did not change significantly, which supports the notion that these general psychological constructs are stable over time.

In conclusion, the exercise programme was shown to be effective in improving the physical, physiological, and those specific psychological parameters

I wish to dedicate this work to the memory of

my uncle

AHMED

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both its location - as an intersection between the West and the East, and the number of people of different nationalities who work and live in Bahrain (according to the latest census, 1991, 37.8% of the population in Bahrain are non-Bahraini). Ideal Western body and lifestyles are portrayed in the media and imported magazines in Bahrain. There is no study conducted on Bahraini society to reveal what ideal female figure is admired by Bahraini women and men.

Research has shown that the desire for thinness is increasing among women in the West, along with the prevalence of eating disorder diseases (Garner et al 1980). The same source indicated that the prevalence of obesity among ordinary adult women is increasing in Western and North American societies. These findings imply that there are social pressures on Western women to be thin, which lead some to be anorexic and bulimic (e.g. models; sports women), while some women moved to the other end of obesity-emaciation continuum. Much of the literature indicated that this ideal of thinness among women is not universal (Ford et al 1990), as in some societies (Jamaica), plumpness is considered ideal (Smith & Cogswell 1994). It is suggested that in these societies, eating disorder diseases might not be found among women (Lee 1993). It should be noted that some societies are strongly influenced by the West, e.g. Egypt, Hong Kong (Lee 1993; Ford et al 1990). As mentioned earlier this drive for thinness might exist in Bahrain, and on the other hand, obesity is increasing among women there, the prevalence of obesity among adult women in Bahrain is high (40%) (Musaiger 1990). Obesity is a risk factor for many life threatening diseases, such as hypertension, heart disease, some forms of cancer, and diabetes. There are many factors contributing to obesity: physical, social, psychological, and genetic. Lack of activity is believed to be one of the main factors causing obesity. Alongside the social reform that has taken place in Bahrain, the status of women has also changed. Women in the early days used to be active, they used to work in trading (cottage industry), farming, selling fresh water, and being housewives. The economic advances of Bahrain, which took place during the increase in oil revenue, have also contributed to changes in Bahraini women's lifestyle, with shifts from active to sedentary. The pattern of food consumption has also changed to a higher caloric diet.

These factors have resulted in increasing women's energy intake and decreasing their energy output, which has led to increases in obesity.

Parallel to the secular awakening to the importance of exercise in the early Eighties, women in Bahrain showed interest in exercise programmes, particularly aerobic dance programmes. Physical fitness and weight reduction are believed to be the major factors that influence Bahraini women to engage in exercise programmes (Hassanain et al 1992; unpublished paper). Hassanain et al questioned 62 women participating in exercise programmes about their motives for exercising. 66% of the women indicated that they were there for gaining physical fitness, and 47% reported that they were exercising for weight reduction purposes (Hassanain et al 1992).

The effects of exercise programmes on body composition are well documented, in which most studies reported that reduction in body fat is the most pronounced alteration in body composition with exercise (McCord et al 1989; Schaberg-Lorei et al 1990). The effects of exercise on body image and self-esteem are not that clear. Some studies reported improvements (Eide 1982), while others reported no changes in these psychological variables (Eickhoff et al 1983). This could be due to the use of different instruments to measure the constructs, and different terms to define them. Furthermore, most of the studies used body image and self-esteem as general or unidimensional terms, in which changes are not expected. Studies investigating exercise and more specific dimensions of self-esteem (physical, sport competence), remain uncommon and much effort is now being focused on developing new instruments prior to studying the effects of exercise on them. Therefore, generally speaking, there are few studies in this area, and more specifically there are no such studies that have been conducted on Bahraini women. Most of the Western exercise programmes were developed and tested on Western women. These programmes, according to the researcher's experience in this field, are not applicable on Bahraini Muslim sedentary women, who live in a hot and humid climate. Thus, in order to establish a proper exercise guideline for Bahraini women, it is important to study the effects of exercise on the different aspects (physiological, physical, psychological, and social) of the body.

The studies conducted by the researcher (Al.Ansari 1990; Musaiger & Al.Ansari 1992), indicated that there is a lack of research in Bahrain regarding the following:

- psychological dimensions of women's bodies (e.g. body image),
- social expectations relating to women's body composition and body image,
- relationships between body image, body composition, and self-esteem in Bahraini women,
- ideal female figure among Bahraini women and men, and
- physical fitness status of Bahraini women: the effects of exercise programmes on Bahraini women's body composition, body image, self-esteem, and physical fitness.

In order to address these issues a multi-disciplinary approach was required for an integrated study of Bahraini women, their bodies, and the role of exercise. While there are many studies conducted on women's bodies in physiology (Durnin & Womersley 1974; Jackson et al 1980; Brodie & Slade 1989), psychology (Secord & Jourard 1953; Ben-Tovim & Walker 1991a), and sociology (Kissling 1991; Garner et al 1980), few studies have considered the interaction of two disciplines on the body (Langston 1979; Jourard & Secord 1955; Brodie & Slade 1988). Langston (1979) found that females with higher percentage body fat had a negative body image; and those with lower body fat had a more positive body image. Polhemus (1978) recommended the application of multidimensional research which encompasses physiological, psychological, and sociological dimensions, and the interaction between them to study the area of human body. The importance of this kind of such study lies in the influence and contribution of each of these disciplines on the others. Therefore this study, using a multidimensional approach, investigated first, the body composition, body image, self-esteem, and social aspects of the body in Bahraini women, and the interaction between them: and secondly, the effects of an exercise programme on body composition, body image, self-esteem, and physical fitness of Bahraini women. Bahraini men's attitudes and opinions of their wives' bodies and the ideal female body were considered. The study considered the nature of the population (Bahraini Muslim sedentary women), therefore appropriate research methods and

instruments were chosen. The researcher experience in the field of exercise for Bahraini women was taken into consideration, in which the exercise programme used in this research was organised accordingly.

AIMS

1. To investigate the relationships between body image, body composition, and self-esteem of Bahraini women.
2. To investigate the effects of a systematic exercise programme on the body image, body composition, self-esteem, and physical fitness of Bahraini women.
3. To explore the social and cultural influences on body image of Bahraini women.

OBJECTIVES

1. To investigate the body image of Bahraini women through:
   a. perceptions of the current body shape and size
   b. perceptions of the ideal body shape and size
   c. attitudes towards the body
2. To investigate the body composition of Bahraini women using the following measurements:
   a. body mass
   b. height
   c. Body Mass Index
   d. percentage body fat
   e. fat mass
   f. fat free mass
3. To investigate the self-esteem of Bahraini women:
   a. general self-esteem
   b. physical self-perception
4. To investigate relationships between body image, body composition, self-esteem and the social characteristics (marital, educational, and occupational status) of Bahraini women
5. To explore Bahraini men's perceptions of their wives' current figures, their wives' current body sizes, the ideal female figure, and the ideal female body size

6. To organise a systematic exercise programme with a frequency of 3 days per week, duration of 60 minutes per session dividing between the warm up phase, the main phase, and the cool down phase, and intensity relating to the current fitness levels of groups of Bahraini women
7. To study the body image (perception and attitudes) before, during, and after the exercise programme of Bahraini women
8. To study the body composition before, during, and after the exercise programme of Bahraini women
9. To study the general self-esteem and the physical self perception before, during, and after the exercise programme of Bahraini women
10. To study the physical fitness (cardio-respiratory endurance, flexibility, muscular endurance and strength) before, during, and after the exercise programme of Bahraini women
11. To investigate the effects of the exercise programme on the men's perceptions of their wives' (the exercisers) current figures, and their ideal female figure
12. To investigate the relationships between changes in body image, body composition, self-esteem, and physical fitness of the samples of Bahraini women associated with the exercise programme.

CHAPTER II
LITERATURE REVIEW

The review will be divided into sections, each representing one area of the research. Section I will include the literature on body composition, body image, and self-esteem, including the theoretical frameworks; strengths and weaknesses of measurement techniques; and cultural issues. Relationships between body composition, body image, and self-esteem will also be reviewed.

Section II will focus on exercise programmes and their effects on body composition, body image, self-esteem, and physical fitness, especially in relation to adult women populations and their cultural context.

SECTION I

1. BODY COMPOSITION

INTRODUCTION:

Research on body composition has grown rapidly in the past 50 years, although the foundation for much of the current theory and methodology was established many years ago (Behnke and Wilmore, 1974). Interest increased following the current trend in physical fitness and the public awareness of health problems associated with obesity. Evaluation of body composition has been recently included in various fitness test batteries (American Alliance for Health, Physical Education, Recreation and Dance (AAHPERD), 1980; Blue Cross and Blue Shield of Delaware, 1980; South Carolina Department of Health and Environmental Control, 1978 (cited in Pate et al, 1989); and The Allied Dunbar National Fitness Survey, 1992). Body composition measurements are also used for other purposes such as the assessment of normal and abnormal growth, and in clinical situations to study the nature and treatment of obesity and a number of eating disorder diseases like anorexia nervosa.

The concern in weight reduction programmes is to ensure that subjects are not mistakenly assessed as obese or overfat: distinctions must be drawn between overfatness and overweightness (Behnke and Wilmore 1974). Obesity refers to an excessive amount of fat in the body, assessed by one of the methods quantifying body fatness e.g. hydrostatic weighing technique or skinfold thickness measures. It is well established that for health, body fat should not be too high or too low. A high value of body fat indicates obesity, associated with several diseases (discussed later); and a low value of body fat could impair body functions. There is disagreement about what values are considered too high or too low. However, some investigators have used arbitrary norms to define obesity, for example a range of 30% - 35% body fat for females and over a range of 20 - 25% body fat for males is the index of obesity (McArdle et al, 1986; 1994; Wilmore & Costill 1994; A round table 1986). These norms are based on deviation (standard deviations) from

average body fat values of normal people (data from a number of studies of American men and women aged between 17 and 50 years). Body Mass Index (Mass/Height^2) is an indicator used to define adiposity, based on weak or no correlation between height and weight. Because this index cannot distinguish between lean body mass and fat mass, its use to define obesity is not recommended (Brodie & Slade 1988), but in large surveys and clinical settings for epidemiological reasons, Body Mass Index has been used to define obesity. Body Mass Index (BMI) values over 28 and 30 in women and men, respectively, are considered as indices of obesity (agreed by the Fogerty Conference, U.S.A. 1979; adopted by the Royal College of Physicians - cited in Allied Dunbar National Fitness Survey 1992). Overweight on the other hand, is defined as body weight in excess of a standard (Katch and McArdle, 1983). The standard traditionally used to classify people as overweight, average, or underweight is the ideal or reference weight for height calculated from height-weight tables, such as Metropolitan tables 1959; 1983. Height-weight tables were established by insurance companies in the U.S.A. and Canada (Metropolitan Life Insurance Company 1959,1983; Society of Actuaries 1959), based on data collected for the Build and Blood Pressure Study, 1959, and National Health and Nutrition Examination Survey, 1971-1974. The Metropolitan height to weight tables assigned an arbitrary "reference" weight for ranges of heights, for policy holders (relative weight calculated by dividing a person's weight over the "reference" weight for his/her height). This "reference" value was established in accordance to the relative weights (based on data from the Build and Blood Pressure Study, 1959), which were found to be associated with minimal subsequent mortality rate experienced by insured people (Van Itallie 1985).

BMI and other height-weight tables could be useful for initial medical screening of obesity and overweight, but they have limitations when applied to individuals, since they do not differentiate between overweightness and overfatness: they do not quantify the fat within the body (Keys and Brozek, 1953). A person could thus be classified as overweight, yet have a low

percentage of body fat, as with a physically fit athlete. Such classifications can be misleading: weight reduction programme for this person would not be advisable and could impair his/her health status.

There is a biological minimal limit beyond which body weight reduction endangers health: the minimal limit of body weight has been suggested to be between 5% and 10% body fat for men, and 15% and 18% body fat for women (Lohman, A round table 1986). These minimal limits are required for normal physiological functioning of the body (Katch and Katch, 1984).

Body composition research has been widely conducted for various purposes, all around the world, although most of the measurement techniques have been developed by Western (often American) male investigators. The applicability of these techniques on subjects from non-Western and American societies was not considered. Several issues could influence the reported validity of body composition methods, when applied on subjects from other societies. For example, it is recommended that clothing should be removed for skinfold measurements, but this is not practical and could cause embarrassment for Muslim female subjects. Jackson and Pollock (1985) modified their equations for males and females, by removing the thigh skinfold measurement from the equations, because they embarrassed their subjects.

For Muslim women, all the measurement sites can cause embarrassment, even if the examiner is a female. In this case, the only option is to measure them with their clothes on, and to measure the clothing separately and subtract it from the skinfold measurements, although it is not yet known whether this modification would affect validity. Furthermore, the equations used to predict the percentage of body fat have also been developed and cross-validated only on Western and American samples.

DEFINITION OF BODY COMPOSITION COMPONENTS:

Body composition refers to the basic components of the body that account for total body weight, including bone, fat, "active tissues" (muscles, glands and nerves), blood (plasma and cells), and interstitial fluid (Brozek and Keys, 1951). Body composition studies are concerned with the quantification of these components. However, this in humans is not easily achieved with accuracy, especially with the existing methodology (Ward et al, 1984). Each component of the body has different chemical compositions. Ward et al (1984) described how adipose tissue consists of 60 to 95 percent fat, with water as the remainder; muscle compromises about 75 percent water, 20 percent protein, and the remainders are minerals and fat. The chemical constituents of bone are mineral and water (Ward et al, 1984). Researchers therefore commonly utilise the two component model, in which the body is seen as: lean body mass or fat free mass: and body fat. According to Keys and Brozek (1953), lean body mass and fat free mass are not synonymous; lean body mass includes the body's organs, muscles, water, and also contains a small amount of essential lipid. Fat free mass, on the other hand, excludes all lipid.

This issue has caused confusion between researchers, and some have used the two terms interchangeably (Brooks and Fahey 1987; Hassager et al 1986), while others differentiate between them (Lohman 1992; Buskirk and Mendez 1984; Brodie 1988; Keys and Brozek 1953; and Durnin and Womersley 1974). This uncertainty has made the estimation of lean body mass or fat free mass even more confusing. The traditional method used to calculate lean body mass is by subtracting fat mass from body mass. Shephard (1991) and Buskirk and Mendez (1984) argue that the value resulting from this calculation refers to fat free mass, since fat free mass does not contain any lipid.

The body fat component of the body includes two fat depots: essential fat and storage fat. Essential fat is the fat required for normal physiological functioning, for example, as an energy store. In females, essential fat also includes sex specific fat. Essential fat is found in various organs of the body

such as the central nervous system, bone marrow, heart, liver, lungs, brain, intestines, muscles, and (in females) the mammary glands and pelvic region. It is estimated to be about 3% and 12% of the total body weight for males and females respectively (Katch and Katch 1984). The four-fold differences between male and female values of essential fat in relation to body mass are believed to be biologically important for child-bearing and other hormone related functions (Katch and McArdle 1983; and Katch and Katch 1984).

The other depot of fat is storage fat which is located subcutaneously in adipose tissue. Storage fat can be found in other areas of the body including intermuscular fat, intramuscular fat, and the thoracic and abdominal cavity (Lohman 1981; Shephard 1991). Stored fat is estimated to be a third of total body fat in both sexes, although it ranges between 20% to 70% when age and the degree of obesity are accounted for (Shephard 1991).

METHODS OF MEASURING BODY COMPOSITION:

Body composition measurements can be performed using two general procedures, direct and indirect. The direct method relies on chemical and anatomical analysis of human cadavers and animal carcasses (Shephard 1991), even though most of the assumptions and theories of indirect measurements are based upon cadaver data (Brodie 1988; Katch & McArdle 1983), including the components of body composition and the methods employed to measure them. However, these direct methods have difficulties related to analysis procedures and to ethical and practical issues in obtaining suitable cadavers. It is also very time consuming. Indirect methods are therefore used by investigators to study the body composition of living humans.

Indirect Methods:

There are several methods available to quantify body fat, fat free mass, bones, and muscles: some are laboratory techniques (densitometry is the most popular); others are field methods e.g. skinfold thickness. A following

review of densitometry and anthropometry is included as anthropometry is used in this study and densitometry is important for validation.

Laboratory Methods:

A number of laboratory techniques are used for the estimation of body fat and fat free mass, including densitometry or hydrostatic weighing techniques for body density measurements, measurements of body water by isotope dilution, and whole body counting of potassium-40 (Behnke and Wilmore 1974). The most widely used method is hydrostatic weighing which measures body density directly and estimates percentage body fat indirectly. This method is considered as a reference technique against which all of the other indirect methods are validated (Lohman 1981 ; Brooks & Fahey 1987 ; Brodie 1988). Hydrostatic weighing methods are based on Archimedes' principle of specific gravity and are used to measure body volume (Brodie 1988). Body volume is calculated as the difference between body mass out of water and body mass in water.

The underwater weighing technique is considered to be a valid (Behnke & Wilmore 1974) and reliable technique (Siri 1956) for measuring body composition. Yet the standard error of estimation for the hydrostatic weighing method is found to range from 2% to 2.8% body fat in adults, and may be greater than that in children and older people (Lohman 1992). This method is also expensive (Wong et al 1988), and time consuming, and requires specialist examiners to carry it out (Jackson and Pollock 1985). Since this technique needs the full co-operation of subjects, and also requires them to be underwater for about 10 seconds without breathing, it is considered to be inappropriate especially for children, elderly people, and non-swimmers (Jurimae et al 1992).

Nevertheless, the hydrostatic weighing technique is still considered to be a "gold standard" method and it is used widely to validate other new techniques.

Field Methods:

Due to the complexity and expense of laboratory methods and their impracticality for field work and mass populations, other simpler methods have been introduced. Of these, anthropometric measurements are most used by researchers. The skinfold thickness method, body circumference measurements, and weight to height indices (W/H, W/H^2) are reviewed below.

Skinfold Thickness Method:

The skinfold thickness method, also known as the "fatfold" method, measures a double layer of skin plus underlying subcutaneous fat: it is based on the assumption that about 50% to 70% of body fat is located subcutaneously and is related to total body fat (Lohman 1981; Katch & Katch 1984). The method is simple, especially when the experimenter is well trained; and economic when compared to other instruments such as A or B-mode ultrasound. A factor analysis completed by Jackson and Pollock (1976) showed that skinfold thickness measures a single common factor, that is subcutaneous fat. The multiple correlations between factor scores ranged from r= 0.88 to r= 0.94 for males and females. Jackson and Pollock (1976) suggested that skinfold measurements of several sites of the body, when summed, can be used as a good indicator of overall subcutaneous fat, and hence can be used to predict total body fat (Jackson and Pollock 1976). Quatrochi et al (1992) measured skinfold at nine sites and factor analysed them to examine whether these sites measured similar body composition factors. Their results indicated that all nine skinfolds measure body fat. The factor representing body fat included all the skinfold measurements and fat weight, with high factor loadings of 0.83 to 0.93 for all of the measurements (Quatrochi et al 1992).

The validity of the skinfold thickness technique is dependent upon several factors, including:

- measurement techniques
- location of skinfold sites
- choice of measurement instrument (caliper)

- pressure exerted by the caliper
- skinfold compressibility
- intra and inter-tester reliability

These factors influencing the validity of skinfold measurement technique are classified as technical sources of variation (Lohman 1981; 1992; Brodie 1988). Once these sources of variation are controlled, the method of skinfold thickness can be one of the most reliable scientific methods to predict body fat.

It has been recommended, since body composition research is at an early stage, that standardisation of procedures for skinfold measurements is needed (Brozek & Keys 1951). Nevertheless, different measurement procedures continue to be used by different investigators which have made comparison between these studies difficult. A conference on the standardisation of anthropometric techniques resulted in the publication of the anthropometric standardisation reference manual in 1988, which includes description and definition of 47 anthropometric dimensions and pictures demonstrating the site locations and the technique of measurements (Lohman, Roche, & Martorell 1988). However, these standardised procedures of measurements do not appear yet to be followed by researchers, possibly because of the need to compare with previous research using different sets of formulae and measurement procedures.

The technique of measuring skinfolds includes elevation of the double fold of skin and subcutaneous fat by the thumb and index finger approximately 1 cm proximal to the site to be measured, following the natural contour of the fatfold (Brozek & Keys 1951). The elevated double fold must only include skin and adipose tissue (Lohman 1988). In this respect, the tester needs to be trained in the measurement technique and to be able to differentiate between adipose tissue and the underlying muscles (Harrison et al 1988).

Skinfold measurements are made at different sites, most commonly triceps, biceps, subscapular, suprailiac, abdomen, thigh, and calf (Katch & Katch

1984). Definitions and descriptions of these sites can be found in the standardization reference manual (Lohman et al 1988). However, when equations developed by other researchers to predict body fat are adopted, the measurement techniques used in the original study need to be followed, for comparability and validity (Pollock & Jackson 1984).

Some researchers have described some measurement sites differently: for example Durnin and Womersley (1974) defined the suprailiac measurement site as "just above the iliac crest in the mid-axillary line" (p:79), whereas the same site was defined by Jackson and Pollock (1985) as "a diagonal fold above the crest of the ilium at the spot where an imaginary line would come down from the anterior axillary line" (p:84). Care must be taken when equations developed from either of these two studies are being used, and the suprailiac skinfold would need to be measured twice in different sites.

Another area of concern is what side of the body should the measurements be made. Some researchers have made their measurements on the right hand side of the body, others the left. Womersley and Durnin (1973) suggested that there were no significant differences between the right and left side measurements, while Martorell et al (1988) found small differences in the triceps skinfold measurements, with right hand measurements larger than the left hand, (0.2 to 0.3 standard deviation units). They concluded that the side of the body does not influence anthropometric dimensions, and that the side for measurement is up to the researcher (Martorell et al 1988).

The skinfold caliper is the instrument used to measure the thickness of skinfold. The most commonly used calipers in research are the Harpenden and the Lange (Wilmore & Behnke 1970; Durnin & Womersley 1974; Pollock et al 1975; Jackson et al 1980; Lohman 1981; Jackson & Pollock 1985).

The recommended measurement caliper should have a standard pressure of 10 ± 2 g.mm^2 (Lohman 1981; Brodie 1988; Shephard 1991), although pressures exerted from the caliper's jaws between 9 and 20 g.mm^2 do not

seem to affect thickness measurements (Keys & Brozek 1953). However, caliper pressure over 15 g.mm^2 may cause subject discomfort (Brodie 1988).

Interpretations of Skinfold Findings:

Data obtained from skinfold measurements can be used in different ways. The sum of different skinfold sites can be used as an indicator of the amount and distribution of subcutaneous fat, and for comparative purposes (Shephard 1991).

Body density can be predicted and percentage body fat estimated, from several skinfold measurements by using statistical analyses such as multiple regression analysis (Lohman 1981).

When percentage body fat is established, fat mass and fat free mass can be calculated.

Numerous equations have been developed to predict body composition from skinfold measurements (Sloan & Weir 1970; Durnin & Womersley 1974; Jackson & Pollock 1978; Jackson et al 1980; Lohman 1981), but most of the predicted equations are "population specific".

The first to use regression equation to predict body density from anthropometric variables were Brozek and Keys (1951) for young and middle aged men. Researchers subsequently devoted their efforts to develop prediction equations for specific groups e.g. Wilmore and Behnke (1970) for young women; Sloan and Weir (1970) for young men and women; Pollock et al (1975) for young and middle aged women; Satwanti et al (1978) for young Indian women; Graves et al (1987) for elite female distance runners.

Stepwise multiple linear regression analysis is used to derive predictive equations for body density. This method has been criticised heavily by investigators because the equations derived from this procedure may be accurate when used on the original sample upon which the equations were developed, but may be less accurate when used on another different sample (Jackson 1984; Roche 1984; Brodie 1988). Roche (1984) proposed another

statistical procedure (maximum R) to overcome the shortcomings of stepwise regression analysis. Nevertheless, "population specific" equations remain specific to the original sample.

Pollock and Jackson (1984) raised the issue that "population specific" equations developed from stepwise analysis, assume a linear relationship between body density and skinfold variables. It is well documented that the actual relationship between body density and skinfolds is nonlinear for heterogeneous samples (Durnin & Womersley 1974; Jackson et al 1980). Cross-validation studies on "population specific" equations have shown that age and sex are important sources of body density (Jackson & Pollock 1982).

Subsequently, "generalised" equations have been developed to overcome some of the limitations of "population specific" equations. "Generalized" equations consider subjects' age and sex as well as the curvilinear relationships that exist between body density and skinfold thickness (Jackson & Pollock 1985). The sum of skinfolds is used in the "generalized" equations due to their high correlations (> 0.97) (Jackson & Pollock 1976) and for objectivity (Jackson et al 1978). Jackson et al (1978) reported variation in individual skinfold sites but not with the sums of skinfold.

Quadratic and logarithmically transformed sum of skinfold, in combination with age, are the most popular models used (Durnin & Womersley 1974; Jackson et al 1980). These two "generalized" equations are highly recommended for the prediction of body density and percentage body fat (Lohman 1981; Wilmore 1990).

Durnin and Womersley (1974) were the first to publish "generalized" equations to estimate body fat. A study on 209 men and 272 women from Scotland aged between 16 and 72 years, investigated the relationship between skinfold thickness and body density, and examined the accuracy of using skinfold measurement to estimate body density.

The findings of this study are: first, that the logarithmic transformation produced a linear relationship between body density and skinfold thickness; second, that the subtraction of 1.8 mm skin from the skinfold readings did not reduce the SE of estimation of density; third, that the inclusion of height and weight caused no reduction in the SE of estimation for the male sample, although it resulted in a small reduction of 0.25% fat for the female sample; fourth, that no significant change resulted from the inclusion of limb circumferences; and last, that the standard errors of estimation were found to be 3.5% and 5% fat for women and men, respectively.

Another set of popular "generalized" equations was developed by Jackson, Pollock and Ward (1980) for women, and by Jackson and Pollock (1978) for men. Jackson, Pollock, and Ward (1980) studied a wide range of American women varying in age and body composition: the sample was 331 adult women aged between 18 and 55 years, and randomly divided into a validation sample (246) and a cross-validation sample (82). The validation sample was used for the development of the equation, which was cross-validated on the other sample (cross-validation sample), as recommended by Lohman (1981). The results of this study showed that the multiple correlation coefficients for the body density equations ranged from r= 0.842 to r= 0.867, with standard errors of estimation were ranged from 3.6% to 3.8% fat for the validation group. The correlation between predicted and hydrostatically determined body fat ranging from 0.815% to 0.820% fat, with standard errors of estimation ranging from 3.7% to 4% fat for the cross-validation group. However, the findings of this study indicated that the "generalized" equations are valid and accurate and can be used on women differing in age and body composition (Jackson, Pollock and Ward 1980).

The above mentioned two "generalized" equations (Durnin & Womersley 1974; Jackson et al 1980) were compared in a study by Brodie and Slade (1989) on a sample of 100 women aged between 19 and 57 years. The equation developed by Durnin and Womersley (1974) was found to produce higher values of percentage body fat in the subjects (28.9% ± 4.7%) when

compared to the values that resulted from the Jackson et al (1980) equation (22.3% ± 5.8%). When these values of percentage body fat were compared to the percentage body fat resulting from the "standard" underwater weighing technique (24.6 ± 8.1), Brodie and Slade pointed out that the Durnin and Womersley equation overestimated the body fat of the samples, while Jackson et al equation underestimated it. Brodie and Slade examined the distribution of body fat of their samples, and suggested that these differences could be due to the fact that the Durnin and Womersley (1974) equation did not produce values lower than 17% fat, while Jackson et al (1980) produced values as low as 12% fat (Brodie & Slade 1989).

Body Circumferences Measurements:

Body circumference measurements are used to measure the size of cross-sectional dimensions of the body. Measurement procedures are easy and, with minimal training, accuracy can be achieved (Katch & McArdle 1983). With obese subjects, this method is preferable to skinfold thickness method, because the fatfold of obese people is difficult to grasp, and also because the skinfold calipers are not large enough. Bray and Gray (1988) pointed out that errors related to intra and inter tester are less likely to be a problem with circumference measurements. This method requires only a plastic or a cloth tape applied not too tightly to the skin surface, in order to avoid compressing the underlying tissues. Improper positioning of the tape and the tension applied can affect the reliability and the validity of the measurements (Callaway et al 1988). The recommended technique and the anatomical descriptions of measurement sites are listed in the anthropometric standardization reference manual (Lohman et al 1988).

Circumference measurements can be used alone or in combination with skinfold to predict percentage of body fat (Katch & McArdle 1983), or to study nutritional status (Brodie 1988; Callaway et al 1988), and fat distribution (Bray and Gray 1988). Various indices of body circumferences have been developed to study the distribution of body fat. Waist-to-hip (W/H) ratio is the most popular one commonly used as a quantitative measurement of regional

fat distribution (Bray & Gray 1988). The high value of W/H ratio is believed to be associated with major diseases such as diabetes, hypertension (Seidell et al 1989), and cardiovascular risk factors (Lapidus et al 1984; Hartz et al 1984). Although W/H ratio is a simple and useful method to assess fat distribution in the body, it has several limitations which need to be considered especially when this index is used to investigate risk factors of chronic diseases. According to Lohman (1992) various fat depots are included in this ratio (e.g. subcutaneous fat, intermuscular fat, intramuscular fat, internal fat in the abdominal region): hence, it is difficult to indicate from the W/H ratio which fat depot is related to the risk factor of the disease. Therefore, other indices need to be studied, such as ratio of central to peripheral fat (Lohman 1992). Lohman (1992) referred to Despres et al, 1990 who suggested that abdominal and trunk skinfolds and total body fat should be included with W/H ratio for the study of fat distribution.

Besides, methodological errors are expected in the measurement of waist and hip circumferences. First, there are errors due to the use of different measurement sites as a result of the disagreements between investigators on the definition of the sites. For example, Larsson et al (1984) measured waist circumference at the level of the umbilicus, while Lapidus et al (1984) measured it at the midway between lower rib margin and iliac crest. Second, to ensure accuracy of measurements, consistency is required in the respiration phase during the measurements, especially with measurements of the trunk region (Callaway et al 1988).

Weight, Height Ratios:

Weight to height indices are the simplest of the oldest methods used to evaluate body composition. Two different types are available. The first is the percentage of the average weight of individual of the same height. The other is known as "the power-type index" which calculates either weight to some power function of height or vice versa. The latter includes weight to height ratio (W/H), Quetelet's index, or Body Mass Index (W/H^2), and the Ponderal index ($H/W^{1/3}$) (Lee et al 1981). On correlation between weight to height

indices and body composition, Micozzie et al (1986) indicated that when height was held as an independent variable, W/H^2 for men, and both W/H and $W/H^{1.5}$ for women were highly correlated with weight (r = 0.89 to 0.98), with subscapular skinfold (r = 0.78 to 0.80), and with arm circumference (r = 0.83 to 0.89) (Micozzie et al 1986).

The relationship between Body Mass Index (W/H^2) and percentage body fat was investigated in a study conducted on samples of children and adults of both sexes aged between 6 and 40 years (Roche et al 1981). In children aged between 6 and 12.9 years and in women, triceps skinfold had the highest correlation with percentage body fat (r = 0.84 and 0.77, respectively). Body Mass Index showed the highest correlation with total body fat in girls aged between 13 and 17.9 years and in adults (r= 0.89 and 0.92, respectively). In men, the highest correlation with percentage body fat was found with the body mass index (r = 0.77), whereas, in boys aged between 13 and 17.9 years, there was high correlation (r = 0.94) between total body fat and the subscapular skinfold. Roche et al suggested that the body mass index can be used as an indicator of total body fat for adults and girls but not for boys (Roche et al 1981).

Although weight to height indices showed high correlations with some measurement of body composition, they were criticised because bone diameters are not accounted for in these indices (Himes & Bouchard 1985). However, when bone diameters were included in the weight to height index provided by the Metropolitan Life Insurance company (1983), their accuracy was not found to be improved (Rookus et al 1985). The arguments against the use of weight to height indices to evaluate body fat focus on their inability to differentiate between overweight and overfat persons, as discussed earlier.

In summary, different methods have been utilised to measure body composition either directly or indirectly. With the exception of the chemical and anatomical analysis of cadavers, all of the available body composition techniques are indirect methods. Indirect methods vary depending on

location- laboratory or field. It is apparent that none of the available methods is perfectly accurate. Even the so called "gold standard" method (hydrostatic weighing technique), often used as a criterion method for the other techniques, is prone to some methodological and biological sources of errors.

The advantage of anthropometric methods, in general, and specifically skinfolds, is their well established status. The methodological sources of errors expected have been thoroughly explored and therefore controlled by researchers.

2. BODY IMAGE

Body image was first introduced in clinical situations through the work of neurologists working with patients suffering from brain damage (Tiemersma 1989). The neurologists recognised that brain damaged patients manifested disturbance in how they perceived their bodies including lack of awareness of some parts of the body. During the 1920s psychologists began to study body image in "normal" persons, but only in the 1950s were measurement instruments such as Secord and Jourard's (1953) Body Cathexis Scale and Fisher and Cleveland's (1958) Body Boundary Scores developed and used in non clinical situations.

The term body image has been conceptualised differently by researchers from different disciplines: some use it interchangeably with other body terms such as body percept, body schema, body attitudes, body concept, and body cathexis. The most widely used definition of body image is that given by Schilder (1950):

> the picture of our own body which we form in our mind, that is to say, the way in which the body appears to ourselves. (P: 11).

The process of forming this picture in involves information coming from various body sensations (e.g. vision, touch), and the experience one has of one's body as a unity. This information represents the perceptual aspects of the body, or body schema, which to Schilder is equivalent to body image:

> The body schema is the tri-dimensional image every body has about himself, we may call it "body image." (Schilder 1950, p: 11).

Burns (1979) argues that the two terms are not the same, since body schema is considered fundamental to body image, in which body image is the evaluative aspect of the body (Burns 1979).

As a multidimensional construct, body image consists not only of evaluative or attitudinal aspects of the body, but also perceptual aspects (Freeman et al 1984). Schilder (1950) saw body image as a cognitive (perceptual) construct as well as being related to emotion, wishes, attitudes, feelings, and interaction with others. According to Burns (1979)

> The body image also involves an estimation and evaluation of the physical apparatus in terms of social norms and feed back from others. (p: 150).

Thus, researchers have considered body image as a construct including psychological aspects (perception and attitudes), physiological aspects (perception of the body originating from body sensations which are fed to the sensory and motor areas of the brain), and sociological aspects (interactions with others). To study the multidimensional nature of body image, researchers have investigated perceptual and the attitudinal aspects of its various components, including body boundary, body cathexis, body concept, physical appearance, body size estimation, body spatial position, and body competency (Cash & Pruzinsky 1990).

Body image boundary (Fisher and Cleveland 1958; Fisher 1958; 1961; 1963; and Fisher and Fisher 1964) is concerned with the contact between the individual's body and his/her surroundings. Fisher and Cleveland (1958) focused on how definite and clear an individual is in perceiving his/her boundary, and suggested that this perception of the body boundary is fundamental to that individual's body image and identity. Fisher (1963) states that there are individual differences in the perception of one's boundary, hence

> the individual may view his body as clearly and sharply bounded, with a high degree of differentiation from non-self objects. But contrastingly, he may regard his body as lacking demarcation from what is out there. (p: 62).

Body boundaries are measured by Barrier and Penetration Scores developed by Fisher and Cleveland (1958) and based on Rorschach or Holtzman inkblots. The barrier and the penetration scores indicate how definite an individual is in differentiating his/her body from the outside environment.

Body cathexis is another perspective of body image, concerned with attitudinal aspects, and more specifically, satisfaction with one's body. Body cathexis is defined by Secord and Jourard (1953) as,

> the degree of feeling of satisfaction or dissatisfaction with various parts or processes of the body. (p: 343).

The instruments which have been developed for measuring body cathexis (Secord & Jourard 1953; Tucker 1981; 1983a; 1985) will be reviewed in chapter III. It would appear that the Body Cathexis Scale is not only a multidimensional construct, but is also perceived differently by males and females and by people from different cultures (Theodorokis et al 1991; see chapter III).

Physical appearance as a component of body image involves two different facets: subjective elements (i.e. attitudes towards body size and weight); and perceptual aspects e.g. estimation of body size (Thomson et al 1990). Several methods have been used to measure the physical appearance component of the body image, including image distortion techniques using distorted mirrors; video camera; or distorted photograph.

Size estimation is the most widely used technique by researchers, especially in clinical situations. The procedure includes asking subjects to estimate their weight, height, and the sizes of various body parts, in which actual measurements are available for comparison (discrepancy scores) (Jourard & Secord 1955). Whether the size estimation a person made is accurate or not

is measured by another technique (Accuracy of Body Size Indices) or indices of overestimation and underestimation which are calculated from the estimated and the real values. A choice from a range of silhouette figures (ranging from very thin to very fat) is another popular technique (Stunkard et al 1983; Fallon & Rozin 1985).

Ben-Tovim and Walker (1991b) suggested that attitudes towards the body (the physical appearance) are multifaceted and need to be investigated by multifaceted constructs. In developing their questionnaire, they interviewed women from South Australia on their attitudes towards their physical appearance and functions of their bodies and found that while weight is the central issue in women's concern about their physical appearance, other more complex and multifaceted aspects of the body are also important. Accordingly, the authors constructed the Ben-Tovim and Walker Body Attitudes Questionnaire containing six subscales: (1) feeling of overall fatness; (2) self-disparagement; (3) strength; (4) salience of weight; (5) feelings of attractiveness; and (6) consciousness of lower body fat.

When people are asked to estimate or rate their attitudes towards their physical appearance, it is believed that their views of their bodies as "social objects" are involved (Cash 1990). Because the body does exist in a social surrounding, one can expect that evaluation of one's body will involve more than one's subjective feelings and perception. The social body ideal, the opposite sex ideal, and one's own ideal may be used as references against which to be judged. Recent measurement techniques (Rozin & Fallon (1988); and Lamb et al 1993) consider the issue of the social influence on the body in their studies by including questions on how the individuals perceives their bodies as reflected by other's and individuals' perceptions of other-sex preferences for an attractive body. The method usually used in these circumstances is the range of silhouette figures.

SEX AND GENDER DIFFERENCES:

There are differences in how females and males value and perceive their bodies, with females being more dissatisfied with their bodies than men (Rozin & Fallon 1988; Lamb et al 1993). While males show dissatisfaction with their upper part of their bodies, females are least satisfied with their lower body parts (Tucker 1983a; 1985). Tucker reported significant differences ($P < 0.0001$) between college aged females' and males' attitudes towards their body parts (legs, weight, and hips), with females' scores lower at these items. Tucker showed that the Body Cathexis Scale represents four factors for both sexes; the fourth factor for women consisted of items related to weight and lower body parts, while the men's fourth factor consisted of physique and muscular strength items. Tucker (1985) suggests that women perceive their body build as a function of their weight and lower body; while men perceive theirs as a function of their upper body part and muscular strength. Men were shown to have much higher body cathexis scores than women in the items waist, hips, thigh, weight, and fitness, while such items were found to be the lowest areas of the body to be cathected by females. On the other hand, women were shown to score higher than men in items such as shoulder and chest, which cause men's concern (Salusso-Deoner & Schwarzkopf 1991): males appear to want to be larger in these areas of the body (Jourard & Secord 1955).

With the Western ideal of thinness for women and muscularity with broad shoulders for men, it is not surprising that any shift from the ideal will cause dissatisfaction with or even distortion in the body image.

AGE AND BODY IMAGE:

Can the process of ageing change people's perceptions of their bodies; and is the ideal body of the young different from that of older people? These and similar questions are the subjects of recent investigations in the area of body image.

Of particular interest is the notion of the inconstancy of the ideal female figure across time. In Nineteenth Century Europe, plumpness was considered socially desirable and represented the standard of women's beauty, while figures like Jayne Mansfied and Marilyn Monroe were the Western ideals of the 1950s. The "Twiggy" body was admired during the 1960s and 1970s (cited in Lamb et al 1993). With this shift over time towards thinness in the ideal female figure, it is possible that older females are more attached to the ideal of their time. Rozin and Fallon (1988) compared male and female attitudes towards the bodies of old and young subjects, where the older subjects were the parents of the younger subjects. Results indicated the existence of sex and age differences between groups on the body image variable as measured by the silhouette choice method, ANOVA showed that women are more dissatisfied than men with their body image ($P < 0.004$); and that the older subjects are less satisfied with their bodies than the younger ($P < 0.001$). All of the groups, except the sons, showed that their perceived current figures are heavier than their ideal figures. The authors did not find any age effect on women's attitudes towards their weight; both mothers and daughters were shown to be concerned. The authors concluded that their study revealed more sex than age differences.

Lamb et al (1993) studied differences in the perception of current and ideal figures between two generations of males and females, using the silhouette figures scale developed by Stunkard et al (1983). Significant differences ($P < 0.001$) were found in the perceptions of their current figures between the two groups of women. The older subjects perceived their bodies as heavier than the younger women. Both female groups preferred a thinner body, although the younger group preferred a much thinner figure than did the older group ($P < 0.000$). Among male groups, the older perceived their bodies to be heavier than the younger group; the difference between them is significant ($P < 0.000$). As with Rozin and Fallon (1988), the young men in this study were the only group that seemed to be satisfied with their body image.

Davis and Cowles (1991) did not find any age effect on women's attitudes towards their weight. Among their younger sample, 80% wanted to lose weight, compared to 70% of the older sample of women. On the other hand,

age has a significant effect ($P < 0.01$) on men's attitudes towards their weight. 61% of the older male subjects wanted to lose weight, compared to 33% of the younger group.

Theodorakis et al (1991) studied the body cathexis of 3 age groups of women ranging from 18 to 45 years, including the age effect on women's satisfaction or dissatisfaction with their body part; no age differences in body cathexis scores were found.

It therefore seems that age has little to do with women's preference for thinness, though their ideal of thinness is most extreme among the younger women. It could be because as women grow older they become more aware of their bodies and place more attention and effort on body maintenance and care. Rackley et al (1988) reported that middle-aged women (35-55 years) who showed that their body image is important have also shown that they are more satisfied with their bodies than those who reported that their body image is not important. Satisfied women are reported to have higher self-esteem scores and feel more in control of their lives.

On the other hand, Van Gyn et al (1987) reported significant differences (MANOVA ranging from $P < 0.01$ to $P < 0.001$) between young women (less than 40 years) and older women (over 50 years) in the followings: perceived body size; ideal body size; perceived body shape; ideal body shape; discrepancies between: the actual and the perceived body size; the perceived and the ideal body size; the actual and the perceived body shape; and the perceived and the ideal body shape. Like the other findings, the older subjects were more accurate in perception of their body sizes and shapes, and their ideal did not deviate as much as the younger group from their perceived sizes. The ideal figure of the older group was a more proportional shape, while that of the young was wide shoulders and narrow hips. The authors suggested that the proportional figure might be the ideal female figure at the time when the older subjects of this study were young.

The findings listed in this section (age and body image) diverge, since some reported differences between the old and the younger subjects, while others showed no differences. This could be due to factors other than age (e.g. physical health and psychological factors) and to cohort characteristics relating to social context.

It can be concluded that women in general (younger and older) are preoccupied with their body shapes and sizes. Thinness appears to be desirable among younger and older women, although the degree of thinness differs with younger women desiring a thinner figure than older women. The older women seem to be more realistic in assigning their ideal female figure, which is not very far from their actual and their perceived figures. The younger women seem to be under more societal pressure to be thin.

DEVELOPMENT OF BODY IMAGE:

The development of body image involves internal (biological) stimuli e.g. the process of ageing, and external (sociological) stimuli e.g. social comparison, the reaction of others, and "significant others". Burns (1979) defined significant others as people who are important to the individual e.g. parents are the most significant others in a child's life. Feed back regarding the body from other people, especially from those significant people, can contribute to forming and moulding body image from childhood onwards. Hanaachech (1971) noted that feelings about the self rely on the feeling about the physical self, which depends on the people around the individual. Stunkard and Mendelson (1967) pointed out that the notion body image disturbance and self consciousness in obese persons is triggered by the view obese persons hold about how other people judge their bodies. Stunkard and Mendelson identified several factors that contributed to the development of body image disturbance, including negative evaluation of obesity by significant others.

The reaction of others and positive comments enhance one's self and body (the relationships between body image and self-esteem are reviewed elsewhere in this chapter). Maehr et al (1962) studied this issue on boys

aged between 14 and 16 years old who were tested on a self-rating test on a pre-post-test basis. After the pre-test phase, the subjects were asked to perform physical tasks in which they were observed and assessed by experts in physical development. The experts' assessments included either approval or disapproval statements. The subjects then were asked to answer the self rating post-test. The results indicated that those who received approval statements increased in their post-test self-rating scores, while those who received disapproval statements decreased in the post-test self-rating scores (Meahr et al 1962). Haas and Maehr (1965) further investigated whether this effect of other reactions on self-rating scores (found in the above study) is stable over time or not. Following the same procedures, the subjects were divided into two groups: one consisted of those who received approval statements, and the other of those who received disapproval statements. The post-test self rating measure was performed four times: after one hour, 1 day later, 6 days later, and 6 weeks later. The findings indicated a stable effect of approval and disapproval judgement of the experts, as the approval group increased significantly ($P < 0.05$) in their scores over the four post-test measures, while the other group showed a reduction in their scores over the four measure times (significant reduction at $P < 0.01$) (Haas & Maehr 1965).

Another source of stimuli to the development of body image is social comparison, which people use to evaluate themselves in order to know their limitations and capabilities. Those others could be people who are close to them (from similar environment) or not close to them (e.g. from the mass media). Festinger (1954) suggested that comparisons may be made with those who are superior to oneself, in this case improvement in one's self may result (in order to be like them and learn from them); or alternatively with those who are inferior to oneself (in order to feel superior to them). Festinger stated that when comparison is made with people who are similar (i.e. in abilities), information about individual capabilities is gained, while comparison with those who are dissimilar to an individual, information about what is lacking in an individual's abilities is gained.

People, especially women, compare their physical appearances with those of others (e.g. models, movie stars) to whom they may aspire, in order to evaluate their appearance against that which represents an ideal, or social norm of beauty (to be discussed later). If an individual's physical appearance deviates from the social norm, low evaluation of physical appearance may result. It is well documented that the thin female body is considered the social norm of physical attractiveness in North America and the Western Countries, although this may not be the case in some other societies such as Japan (Kowner & Ogawa 1992), and it would be helpful to refer to data from these societies. Kowner and Ogawa (1992) examined whether the contrast effect does exist among undergraduate Japanese females and males when they judge physical attractiveness of others as well as their own. They concluded that Japanese women rated high attractive Western photos higher than high attractive Japanese photos, and low attractive Western photos lower than low attractive Japanese photos. Non-Western women have a view, from the media, that Western women are superior to them in their look, the way they dress, their social life, and their freedom. Thus it is not surprising that the Japanese women rated the Western women as more attractive than their Japanese peers. The findings showed that the more attractive the stimuli (photos), the lower the self esteem and the body esteem of the female subjects. On the other hand, male subjects showed an "enhancing effect", resulting from exposure to high attractiveness photos This could be related to defensiveness as high attractiveness photos may be considered as threatening by the male subjects or simply to "jealousy". The authors concluded that a contrast effect when judging others' as well as one's attractiveness is evident among Japanese in a similar manner as it was reported by American subjects (Kowner & Ogawa 1992).

CHANGES IN BODY IMAGE:

It is well documented that body image is a dynamic construct (Cash & Pruzinsky 1990), which can be changed and developed with new experiences, emotions, learning, action, attention and memory (Schilder 1950). Changes in one's physical appearance through cosmetic surgery can

change one's perception of one's body (Pruzinsky & Edgerton 1990). Evaluation and feelings about the body are also changed consequently, in which positive attitudes towards the body are adopted if the patient got the appearance he/she wanted, and negative attitudes can be resulted if the operation was not successful (Pruzinsky & Edgerton 1990).

Schilder (1950) stated that any thing in contact with the surface of the body, becomes a part of body image (i.e. clothing). Changes in clothes result in changes in individuals' body image: according to Schilder, body image of individuals will enlarge or shrink according to the clothes they wear. The type of clothes, whether they are tight or loose will also affect body image (Schilder 1950). Schilder also indicates that dressing like someone will change the body image to become like that person. According to Shilder's ideas, when Bahraini women wear Western clothes, their body image becomes more "Western". It is also possible that they may perceive their body image smaller if they dress in Western clothes, and larger if they dress in Islamic wide and loose clothes.

Whether women's attitudes differ towards the nude body and the clothed body was investigated by Markee et al (1990), employing the original Body Cathexis Scale and the Clothed Body Cathexis Scale on women aged between 25 and 45 years. For the latter, women were asked to imagine themselves dressed for a dinner out and then asked to rate their feelings towards their body parts. Differences between subjects' ratings on the body cathexis and clothed body cathexis were significant ($P < 0.01$ and $P < 0.001$). Subjects were more satisfied with their clothed body parts than their nude body parts. The body parts most affected by clothing were the thigh, chest, hips, and shoulder width. The authors suggested that clothing is not just a cover over the body, but can create a new look and can improve perception of the body. Thus, clothing is recommended to be used as an adjunct in therapy sessions for eating disorder diseases and obesity (Markee et al 1990).

SOCIAL AND CULTURAL INFLUENCES ON BODY IMAGE:

Burns (1979) stated that although body image is subjective, it may be the only visible part of the self which is available for people's evaluation. As discussed earlier, body image forms, develops, and also can be distorted from an early age as children interact with society and significant people around them. This part of the review will discuss social and cultural factors and their effects on women's body image, including: how concerned women are with their bodies and shapes; the existence of the social ideal female figure, and the role of culture in spreading this ideal among women; cultural differences or similarity in perceiving the ideal female figure; and consequences of women's concern for their bodies.

Researchers in psychology and sociology are interested in the social aspect of body image. A substantial amount of research has been carried out concerning women's concerns with their body weight and body shape, most on Western and North American women. Chernin (1981) stated that getting fat is the greatest fear of Americans, even above crime, nuclear war, and unemployment (cited in Kissling 1991). A large survey of 2000 women and men readers of "Psychology Today" magazine (1985) indicated that: 93% of the women readers were obsessed (concerned) with their appearance; 24% of the men and 33% of the women reported that they had negative feelings about their bodies; the majority (55%) of the women reported dissatisfaction with their lower body parts and weight (cited in Cash & Pruzinsky 1990).

Concerns about body size and weight are believed to be generated by ideal images of thin female bodies in Western and the American societies. Garner et al (1980) documented the shift toward a thinner ideal female figure over the period between 1959 to 1979. Data from Miss America Pageant contestants and "Playboy" centrefolds indicated a yearly decline in the average weight of contestants. Not only has contestants' weight declined, but also their body measurements. Playboy "mates" showed a significant decrease in bust measurement ($P < 0.005$) and in hip measurement ($P <$

0.05); an increase in waist measurement ($P < 0.001$) and in their height ($P < 0.001$). Furthermore, since 1970, both the winners of the Miss America Pageant (a yearly decline of 0.17 kg) and the other contestants (a yearly decline of 0.13 kg) have become thinner. On the other hand, a yearly increase (0.14 kg per year) in the average weight of ordinary American women younger than 30 years was reported in data from the Society of Actuaries 1959-1979. Garner et al (1980) reported an increase in the number of diet articles appearing in popular magazines over the same period. Wiseman et al (1992) reported that the ideal has become even thinner as later data (1979 to 1988) from Miss America contestants showed more decline in average weight. The authors reported that 66% of the contestants were 15% below their expected weight, which means that they tended towards developing eating disorder diseases (Wiseman et al 1992).

The ideal female figure women pursue seems to be difficult for ordinary women to attain, especially if overweight and obese. Many of the women who appear thin in the media (e.g. models) use various life threatening methods such as severe dieting and surgery. Women often do not realise that the thinness they strive for is not healthy, and that using these methods, they can harm their bodily function.

Perceptions of body shape appear to be highly influenced by cultural and social factors. Thinness is considered to be ideal specially among women in the West. In Britain, slimness is synonymous with self-control, elegance, social attractiveness and youth (Dally and Gomez 1980), while fatness is equated with stupidity, illness, self-indulgence and moral weakness (Caputi 1983).

As a consequence of this "ideal thinness", cultures put more pressure on women to be thin, and women respond by dieting (Kissling 1991). Willmuth (1987) reported that about 20 million American women are estimated to be dieting at any given time (based on the Harvard Medical School Newsletter).

Rozin and Fallon (1988) found that about 67% of college aged females were dieting at least some of the time, compared to 25% of college aged males.

Diet, exercise, and other health threatening procedures are aimed at women who are convinced that thinness can be achieved through these methods. The notion of thinness is supported and/or even generated by the diet, fitness, cosmetic, fashion and advertising industries (Lai 1984; Featherstone 1982; Kissling 1991). Kissling cited Schwartz (1986) who reported an increase in the sales of diet foods and beverages at triple the rate of other foods in America. Chronic dieting can cause physical and emotional consequences such as fatigue, depression, anxiety, social isolation and anorexia nervosa (Garner et al 1980). Diets do not always work: Willmuth (1987) noted that 95% of all diets fail, and 90% of dieters gain back more weight than they had lost.

The mass media play an important role in portraying this ideal female figure through T.V, cinema, video, and magazines. A thin female body is shown as attractive, young, healthy, and full of life and energy. British television commercials use thin and attractive women to advertise beauty and hair products, whereas fatter females are used to advertise household products. Myres and Biocca (1992) reported a distortion in women's perceptions (overestimation) of their body size as a result of watching programmes and commercials focusing on the ideal thin body. Percy and Lautman (1994) asked 100 women to rate 21 slides representing advertisements featuring women and fashion models on a line-up of silhouette female figures. Rating the slides were found to be a function of the rater's weight, in which those women who are heavy (> 131 pounds) rated the slides to be thinner than those raters who are thin (91 to 110 pounds).

Kissling argued that slimness is an aesthetic issue and that it is a "woman" problem (Kissling 1991). In this respect Wooley and Wooley (1985) suggested that women are evaluated on their appearance to a much greater degree than men. Compared with males, females show more concern over

bodily appearance (Lamb et al 1993). It is reported that about 90-95% of the individuals who suffer from eating disorder diseases are women (cited in Adesso et al 1994). Millman (1980) reports that overweight men (300 pounds over their conventional standards) do not consider themselves fat, and have no psychological or emotional problems, whereas women consider themselves as fat if they are 15 pounds over their conventional standards. Moreover, underweight women are reported to perceive their bodies as fat, and are more self-conscious about their bodies and less satisfied with their appearance (Wooley and Wooley 1985).

In societies where the thin body shape is ideal e.g. Western societies, obese people are treated as inferior and blamed for being obese (Brownell 1982). Millman (1980) noted that fat women feel that they are discriminated against when it comes to employment, as thin women are preferred by employers. Fatness is related to class, race, and socio-economic factors. Seid (1989) points out that Afro-American women between the ages of 20 and 44 form the largest subgroup of overweight Americans. Dolan et al (1990) suggested that black women are not under the same cultural pressures as white Western women, because slimness is not so ideal. Gray et al (1987) reports that the prevalence of eating disorders diseases is lower in black than white college students.

Socio-economic status is associated with body weight, particularly in Western countries. Wooley & Wooley (1985) showed that while fewer than 10% of women in the lowest socio-economic status are thin, 40% of women in the highest socio-economic status are thin. Musaiger & Al.Ansari (1992) reported that Bahraini women of lower socio-economic status run the highest risk of obesity than women in the other social classes.

This uneven distribution of obesity (social, economic, racial, and ethnic factors) does not encourage weight reduction in some people. Social attitudes toward obesity may lead obese people to resist weight reduction. Lai (1984) cited studies that showed that while about 25% of the British

people were trying to lose weight at any given time, some obese people were making no effort to lose weight. The obesity rate is increasing especially among adult women (Garner et al 1980; Musaiger 1990).

The ideal of thinness is believed to be influenced by men's preferences for a thin body in females (Fallon and Rozin 1985). However, Fallon & Rozin 1985; Rozin & Fallon 1988; Lamb et al 1993 found that females exaggerate the degree of thinness they think men prefer in women's bodies. Lamb et al (1993) reported that older men prefer heavier women than the young men do.

CULTURAL DIFFERENCES IN THE PERCEPTION OF BODY SHAPE:

Ford et al (1990) indicate that the drive for thinness is not universal, and that some societies admire an overweight or even obese figure. For example, in the City of Salalah in Oman, the obesity rate is found to be high (47%) among women (cited in Musaiger 1990). In contrast, the incidence of eating disorder diseases such as anorexia nervosa is increasing in the West where thinness is considered ideal (Garner et al, 1980). Several cases of this disease have occurred in Bahrain, though no official report has been published.

Jamaican adolescent girls were shown not to be concerned with their weight as much as Western girls: they were accurate when they were asked to perceive their weight and size (Smith & Cogswell 1994). Among Jamaican subjects, who were classified as normal weight, 13% reported that they perceived their body weight as overweight, compared to (43%) for the Americans. Smith and Cogswell (1994) state that although Jamaica as a tourist country is open to the West, where thin Western ideal is portrayed in their media, plump figures are still ideal and socially desirable there.

Cross-cultural differences in perceptions of female body shapes were reported by Furnham & Alibhai (1983), in a study on Kenyan Asian, British, and immigrant Kenyan British females from similar socio-economic backgrounds. Kenyan Asians rated fatter figures more favourably and smaller figures less favourably than did the two British groups. The

immigrant women, however, were even more extreme than the British women in their perceptions, reacting more positively to thinner shapes. The authors suggested that immigration and exposure to Western societies can lead to change in immigrants' perceptions of the ideal body shapes towards a more Western ideal.

Perceptions of body weight and shape are believed to differ among women from different ethnic groups. Wardle et al (1993) examined the issue of cultural differences in perception of body size among White and Asian school girls (aged between 14 to 15 years) and students (aged 19 to 22 years) in Britain, finding differences between the two groups in perception of their own and their ideal body sizes. The Asian subjects were less dissatisfied with their body size, less concerned about their weight, and perceived their bodies as slimmer than the White. They also desired a thinner body to be their ideal. When the actual measurements were considered (the Asian were lighter and shorter than the White), the differences between the two groups were reduced.

Dolan et al (1990) studied the differences in the concern about weight, shape, and eating attitudes between three British ethnic group women (Caucasian, Afro-Caribbean, and Asian). All three groups were concerned about their body weight and shape and also showed more eating disorder attitudes (as measured by the EAT-26 scale), with the highest score reported by the Asians.

Lee (1993) investigated the notion of slimness in other cultures with Chinese college students in Hong Kong. The subjects' desired BMI is found to be lower than their measured BMI ($P < 0.001$), which indicates that the Chinese idealise a thinner body shape. Furthermore, subjects whose BMI was slightly higher than 20.5 kg/m^2 regarded themselves as overweight and wanted to lose weight. This value of BMI is considered normal according to the standard of Western adult women. The women who were reported to be overweight were also shown to score higher in the eating disorder measure (EAT scale). The author suggests that the Chinese students were shown to

appreciate the thin body and they have started to develop eating disorder attitudes. Eating disorders are known to be young female Western diseases, and it is claimed that this disease is not prevalent in Non Western societies. Lee (1993) stated that the prevalence of obesity in Non Western societies (Chinese) is lower than that in the West (0.9% of his study's subjects are obese), and that eating disorder diseases are rare in these societies (Lee 1993).

Cultural differences between American rural women's and Scottish rural women's attitudes towards their bodies were studied (Hamilton & Chowdhary 1989). Both groups were dissatisfied with their hips, buttock, and thighs, as measured by the Modified Body Cathexis Scale. Scottish females were more satisfied with their weight and waist, although the differences were not significant. The only significant differences reported in this study between the two groups are the range of scores: the high to low mean difference which was found to be significant at $P < 0.05$ (Hamilton & Chowdhary 1989).

The body shape preferences of Arab women were studied by Ford et al (1990). The sample consisted of Arab students studying at the American University in Cairo, Egypt. This sample represents Arab women living in their own culture, but at the same time exposed to Western ideals. This study measured the perceived current, ideal, and most attractive female figure to males by using the line-up silhouette scale. The findings suggested that the subjects preferred a thinner body than their current body. The authors compared the perceived current and ideal body shape of this study's sample (Arab) with those of the American women (from the study of Fallon and Rozin 1985, discussed earlier). No differences in the perceived current shape were found between the two groups, although there were significant differences in the ideal female shape, with Americans preferring a much thinner body shape than the Arab students ($P < 0.05$). The Arab females compared to the American were more accurate in perceiving what body shape is preferred by

Arab men (the female figure most attractive to men matched that reported by Arab men students to be attractive):

> it would seem that the Arab women are not misinformed as to the degree of thinness appreciated by Arab men. (Ford et al 1990, p: 506).

On the other hand, exposure to Western cultures does not necessarily create a change in men's attitudes towards female body shapes. Hallinan (1988) compared how Muslim and Judaic-Christian male students at a U.S.A. university perceived female figures. The Judaic-Christians group preferred a thinner female figure than the Muslim sample, and concluded that the difference can be attributed to cultural and/or religious influences. For Muslims living in a Western country, "the strictures of patriarchal society still exist" (Ashfar, cited in Hallinan 1988, pp: 82). There have been no studies to explore Bahraini men's preferences on thinness, although some indicators show that middle aged and older men are more likely to accept overweight women than younger (Musaiger 1990).

The Western ideal of the thin female figure is portrayed in the Bahraini mass media through the national T.V. channel, the English channel, and 24 hours satellite and cable channels. Although these Western stimuli are provided to Bahraini women, it is still not clear from the literature whether a thin body is the ideal among Bahraini females and males, or whether they have their own ideal which could be different than that of the West. However, Bahraini women increasingly are subject to the same kinds of social pressures, and diet and fat removal surgery are among methods used by Bahraini women to approach overweight and obesity. An unpublished report from the Salmanya Medical Centre in Bahrain shows that in recent years, fat removal surgeries increased among women in Bahrain. During 1988, only four cases of women went through this sort of treatment, whereas in 1991, twenty six cases were reported.

In summary, slimness is desirable by almost every woman, no matter where she lives. The degree of thinness does differ between societies, with women in America and the West idealising a thinner body than women from other societies. The prevalence of obesity and eating disorder diseases is also higher in the West. Moreover, women in non-Western societies were more accurate in perceiving their current sizes and more aware of what body size males in their culture prefer.

RELATIONSHIPS BETWEEN BODY IMAGE AND BODY COMPOSITION:

Correlations between the physical and the mental aspects of the body are well documented, especially for college males and females: there is less research on older people. Most studies conducted to investigate correlations between body image and body composition utilise the Body Cathexis Scale (BCS) as a measure of body image; and weight, BMI, or perceived body size as measures of body composition. The review which follows will focus on studies conducted on women, and which used more valid and reliable methods of measurements.

Jourard and Secord (1955) studied correlation coefficients between women's feelings towards their body parts and the measurements of these parts, using 60 female college students. The revised BCS of 12 body parts (height, weight, bust, waist, hips, thighs, calves, ankles, feet, nose length, shoulder width, and neck length) was used to measure the body image of the subjects. Body composition measurements included their height, weight and the girths of above listed body parts. The women's perceptions of their body sizes and their ideal body sizes were taken. Jourard and Secord found positive significant correlations between the women's measurements and the cathexis of weight, hips, thighs, calf, ankle, and feet (r ranged between 0.37 and 0.52, $P < 0.01$), and $r = 0.32$, $P < 0.05$ for waist. Bust girth and bust cathexis correlated with each other negatively and significantly ($r = -0.25$, $P < 0.05$). The women in this study were more satisfied with their body parts, when

these parts' measurements were small, except that for the bust size which was preferred to be large. The women perceived their body sizes accurately, indicating that these body parts measurements were known to them. With the exception of the ideal bust size, which was significantly larger than the perceived and the measured size, all the other ideal body sizes were significantly smaller than their actual or perceived sizes (P ranged between < 0.05 and < 0.001). These findings indicated that the social ideal female figure was small (thin), although the bust size was preferred to be large. The women whose bodies did not match this ideal felt dissatisfied with these body parts (Jourard & Secord 1955). Similarly, Seggar et al (1988) found that those college women who were heavier than their ideal weight, and shorter than their ideal height, reported less satisfaction with their body parts and functions (BCS). Body weight and height were not measured in this study, and subjects were asked to estimate their sizes.

Langston (1979) found that college women with higher percentage body fat scored lower in BCS; correlations between percentage body fat (calculated from skinfold measurements) and BCS were significant ($P < 0.02$). When a revised BSC (consisting of 16 weight-related items; e.g. size of abdomen, hips, waist, figure), Langston found a higher correlation with percentage body fat ($P < 0.01$). The author indicated that this significant correlation between body composition and body image was rather specific to weight related items (Langston 1979).

The only study dealing with this issue of correlations by considering different measurement techniques was conducted by Brodie and Slade (1988). Two dimensions of body image (judgement about body size or accuracy of body size estimation; and attitudes toward the body) were measured by mirror accuracy, calipers accuracy, and dissatisfaction with the body and the desire to change. Body composition was measured by underwater weighing techniques, electrical impedance method, and anthropometry, in which percentage body fat was calculated from each method. The subjects were females ranging in age between 19 to 57 years: 25% of the women were

above their ideal weight (overweight) and the weight range of the subjects was 40 to 121.90 kg. Brodie and Slade found that only the body dissatisfaction dimension of body image correlated significantly with body fat calculated from underwater weighing technique ($r = 0.25$, $P < 0.05$), electrical impedance technique ($r = 0.24$, $P < 0.05$), and anthropometry ($r = 0.32$, $P < 0.01$). The more overfat the women in this study, the less they were satisfied with their bodies. Furthermore, the authors found that those who reported dissatisfaction with their bodies, also reported that they had eating disorder problems (bulimia) as measured by the EAT scale: the correlation coefficients between EAT scores and body dissatisfaction were significant ($P < 0.05$) (Brodie & Slade 1988).

It appears that women's satisfaction or dissatisfaction with their bodies is influenced by what body size is socially desirable. Women express dissatisfaction with their body parts and sizes when their actual or perceived measurements are larger than their ideal. These findings confirmed that because societies, especially Western ones, put so much pressure on women to be thin, it is likely that women who can not achieve this ideal are dissatisfied with their bodies and can develop eating disorder diseases. Furthermore, those who do not posses the social "ideal" may be stigmatised by society and its members. There are social stereotypes for every body type (as determined by morphological measurements: photographing or anthropometry), for both males and females. These stereotypes are generalised as a muscular body type (mesomorph) for males, and a thin body type (ectomorph) for females.

Although different methods have been used by investigators, to measure body image and body composition, all the studies reviewed showed that individuals' body image was negatively affected if their body composition differed from that idealised by societies. This "ideal" is perceived even among young members of societies (males and females), who can be susceptible to negative attitudes towards their bodies, and hence develop other psychological and physical disorders such as bulimia.

3. SELF-ESTEEM

Self-esteem is a term often used to refer to the evaluative aspect of self-concept. It is considered as a component of self-concept, in which self-concept is defined in broad terms, as "a person's perception of himself" (Shavelson et al 1976, p:411). Self-esteem is equated with and sometimes used interchangeably with other terms such as "self-regard", "self-respect", "self-evaluation", "self-acceptance" and other similar terms. Self-esteem is also often used synonymously with self-concept (Wells & Marwell 1976). The importance of feelings and evaluation in self-perception contributes to the explanation of why the two terms are used interchangeably (Wells & Marwell 1976). Nevertheless, self-esteem will be used in this research to indicate evaluation of and feelings about the self. The term self-concept will only be used as cited researchers use it.

To date, there is no universal definition of the term self-esteem (Wylie 1974; Burns 1979; Wells & Marwell 1976; Shavelson et al 1976). However, it seems that most researchers locate their definition of the term within an evaluative framework. To differentiate between the two terms "self-esteem" and "self-evaluation", Coopersmith's (1991) definitions are useful:.

> "Self-evaluation" refers to a judgmental process in which a person examines his or her performance, capacities, and attributes according to personal standards and values and arrives at a decision of his or her worthiness. "Self-esteem" is the evaluation a person makes and customarily maintains with regard to him or herself. "Self-esteem" expresses an attitude of approval or disapproval and indicates the extent to which a person believes him or herself capable, significant, successful, and worthy. In short, a person's self-esteem is a judgement of worthiness that is expressed by the attitudes he or she holds toward the self (1991, p:5).

Similarly Rosenberg refers to self-esteem as:

> a positive or negative attitude towards a particular object, namely, the self (Rosenberg 1965, p:30).

Self-esteem is an important aspect of everyone's life, something crucial to psychological well being.

> Our level of self-esteem affects virtually everything we think, say and do. It affects how we see the world and our place in it. (Sanford & Donovan 1984, p:3).

Self-esteem constructs have been used in educational settings to measure the academic dimension of self-concept (Shavelson et al 1976), and in sport settings as indicators of psychological well being (Burns 1979). It is a useful tool to study psychological changes associated with exercise, since it encompasses different aspects regarding the self. For example self-esteem involves both self-evaluation and self-worth aspects (Burns 1979), and also contains feelings and attitudes towards the self (Wells & Marwell 1976). The term self-esteem is also a part of non-scientific everyday conversation around issues concerning ordinary people like racism, sexism, and equality.

Unfortunately, this term, while extensively used by the public, suffers from inconsistent definition, methodology, and instrumentation (Wylie 1974; Shavelson et al 1976; Wells & Marwell 1976; Burns 1979, Sonstroem 1984). According to Shavelson et al (1976), the literature is full of different instruments to measure self-esteem, due to different definitions of the term itself; this creates additional difficulties in interpreting data from the literature, and using them comparatively.

DEVELOPMENT OF SELF-ESTEEM THEORY:

Self-esteem in the early 1960s was conceptualised and studied as a unidimensional construct, as a "unitary psychological process" (Wells & Marwell 1976). In this regard, self-reporting inventories and scales were used to measure self-esteem (Coopersmith 1967). These scales consist of a list of short questions, to which the respondent is asked to reply using a scale of different responses, and the question scores are summed into one final overall total to indicate the level of self-esteem. The unidimensional construct of self-esteem and its methods of measurement have been criticised by a number of researchers (Wylie 1974; Shavelson et al 1976; Fox 1987). The concept is not that simple: self-esteem, as explained by Wells and Marwell (1976):

> is a deceptively difficult concept to work with, one which requires a much more careful and systematic approach than has generally been the case (p:228).

Wells and Marwell note that it is not enough to evaluate, as a singular unity, individuals who live in and interact with their social surrounding, and also

possess specific abilities and have physical and personal features. They are not one-self people; they have many selves (i.e. social self, physical self, emotional self etc.). Therefore the process of evaluating a person's self needs to consider all these selves (Wells & Marwell 1976). Furthermore, when changes in self-esteem are considered, a unidimensional approach cannot track these changes (Fox 1988). According to Shavelson et al (1976) general self-concept is a "stable entity", in which changes can occur and be observed in lower components (e.g. academic self-concept) but not at the higher level (general self-concept).

These changes in self-esteem components cannot be seen using measurement tools developed to measure a unidimensional (general) self-esteem; multidimensional approaches have attracted researchers' attention (Shavelson et al 1976; Rosenberg 1976). These include different "selves" or "facets" contributing to global self-esteem such as academic, social, emotional, and physical aspects, whose number increases as a person grows older (Fox 1988). For measuring self-esteem as a multidimensional construct, there is a scale consisting of numbers of subscales, each meant to measure one dimension of the global self-esteem, for example, the Tennessee Self-concept Scale (Fitts 1965) includes subscales to measure identity; self-satisfaction; behaviour; physical self; moral-ethical self; personal self; family self; and social self.

This approach of measuring self-esteem has been approved by researchers because firstly, it allows for the recognition of changes in self-esteem and in specific facets (Fox 1988). Secondly, it allows for the identification of any strength or weakness in an individual's self-esteem dimension (e.g. social) which contributes to the overall level of self-esteem. Thus if an individual scores high in the academic subscale and low in the physical subscale, the overall score indicates that this person's low self-esteem is affected by his/her poor judgement of his/her physical self. Thirdly, relationships between global and more specific facets of self-esteem can be studied using

this approach (Fox 1988). Multidimensional instruments are able therefore to measure both global self-esteem and its components.

Recognition of dimensionality in self-esteem has led researchers to investigate further the structure of this construct. A hierarchical organised model has been proposed to study the multidimensional basis of self-esteem (Shavelson et al 1976). Shavelson's model is an educationally oriented one, which consists of global self-concept at the apex, divided into academic and non academic (social, emotional, and physical) and aspects of self-concept at the lower level. Each dimension of self-concept is further divided into more specific subdimensions: for example, the physical self is divided into two subdimensions (physical ability and physical appearance). This pattern of division is carried on until the base of the hierarchy is reached, where very specific experiences of the individual are expected. Shavelson et al (1976) suggested that changes in self-concept start from the base level upward. These changes, according to Fox (1988), can modify the higher dimensions of self-concept and consequently, global self-concept is modified too.

PHYSICAL SELF-ESTEEM:

During the 1980s, more attention was paid to the specific dimensions of self-esteem. Research in physical self-esteem began with proposed models for studying changes in global as well as physical self-esteem in exercise settings (Sonstroem & Morgan 1989; Fox 1987; Fox & Corbin 1989). Fox developed the Physical Self Perception Profile (PSPP) in his Ph.D research, to measure physical self-esteem changes through exercise (see Appendix I). This scale consists of five 6-item subscales that measure self perception of sport, physical attractiveness, physical strength, physical conditioning, and physical self worth.

Fox and Corbin (1989) proposed a three-level hierarchical model of self perception with global self-esteem at the apex. The second level of this model is called the domain level and contains physical self worth; and the third level (subdomain) contains sport competence, attractive body, physical

strength, and physical condition. Physical self worth is used as a mediator between global self-esteem and the four subdomain variables. It is recommended by the authors that a separate instrument be used to measure global self-esteem (e.g. Rosenberg 1965, or Coopersmith 1991). Fox and Corbin report a strong correlation between physical self worth and global self-esteem, and between physical self worth and the four subdomain variables. Furthermore, the subdomains showed stronger correlation with physical self worth than with global self-esteem. The authors point out that physical self worth is a valid measure as a mediator between subdomain and global self-esteem levels of the hierarchy, supported by the correlational findings (Fox & Corbin 1989; Sonstroem et al 1994; Delignieres et al 1994). The hierarchical structure of Physical Self Perception Scale is also confirmed.

Self-esteem studies are shifting from general to more specific. Although Fox has begun to study the second level of the hierarchical model suggested by Shavelson et al (1976), more research is needed to study the lower levels where specific personal experiences are located. These experiences could serve as mediators in self-esteem and exercise relationships.

RELATIONSHIPS BETWEEN SELF-ESTEEM AND BODY IMAGE:

The importance of the body to the self is recognised by theorists and researchers who have developed models and inventories to measure self-esteem. These models and inventories include a component referred to as body or physical self (Shavelson et al 1976; Fitts 1965; Fox 1987). Low self-esteem is believed to be one of the central reasons for the widespread incidence of eating disorder diseases such as anorexia nervosa and bulimia (cited in Polhemus 1978), with low body image and therefore low self-esteem in those who fail to possess a thin body related to anorexia or bulimia (Kissling 1991). It is not clear whether low self-esteem causes negative body image, or distortion in body image leads to low self-esteem. Among women who have negative scores in both, some report that because of their low self-esteem they develop a negative body image (Sanford & Donovan 1984); for others it is the other way around.

It is useful to refer to some empirical data in order to understand the relationships between self-esteem and body image. The Body Cathexis Scale (Secord and Jourard 1953) is the most widely used instrument for the measurement of body image. Secord and Jourard (1953) state that feelings about the body are commensurate with feelings about the self. The authors showed moderate but significant relationships between body cathexis and self cathexis ($r = 0.58$, and $r = 0.66$ for males and females respectively). It is also reported that lower levels of body cathexis are associated with higher levels of anxiety, and in women, with insecurity as measured by the Maslow test. The authors stated "women are more likely than men to develop anxiety concerning their bodies, because of the social importance of the female body" (Secord & Jourard 1953, p:346). Strong relationships between body cathexis and self cathexis were also reported by Rosen & Ross (1968). Joesting and Clance (1979) reported correlation of $r = 0.65$ between body cathexis and self cathexis for male and female subjects.

Zion (1965) investigated relationships between four facets of self concept (self-description; self-acceptance; ideal self; and self-description-ideal discrepancy) and four facets of body concept (body-description; body acceptance; ideal body; and body-description-ideal discrepancy). The findings showed that most of the self-concept facets correlated significantly with those of body-concept (values of r ranged between 0.21 and 0.59 with $P < 0.01$). Rackley et al (1988) found that middle-aged women who have positive images of their bodies also have high self-esteem and mastery of life events.

Rosen and Ross (1968) proposed that higher correlations between self-concept and body image would be established if subjects are asked to indicate subjective importance to body parts. For measurement of body parts and their importance, Rosen and Ross used a list of 24 body parts judged to be relevant to subjects' satisfaction. A list of 17 adjectives was used for self-concept measurement. Eighty-two undergraduates were asked to indicate

their degree of satisfaction for each body part, and how important that body part was to them. As expected, the authors found correlations between body image and self-concept ($r = 0.52$ for all items, $r = 0.62$ for items above mean importance, and $r = 0.28$ for those below mean importance). These findings are important when investigating the influence of body parts perception upon self-esteem: particular attention should be paid for women subjects, because of the importance they place on some parts of their bodies (e.g. height, weight, bust, waist, hips) (Jourard & Secord 1955). The authors related the importance of these five parts to culture, e.g. buying clothes; measurements of these sites are also used as descriptions of ideal female figures (Jourard & Secord 1955).

It is clear that body image and self-esteem are correlated and influence each other. Both concepts must be considered when planning exercise programmes, especially for people undertaking them for weight reduction reasons: in any treatment programme intended to improve body image, the issue of self-esteem should not be forgotten.

SECTION II

THE EFFECTS OF EXERCISE PROGRAMMES ON BODY COMPOSITION, SELF-ESTEEM, AND BODY IMAGE

INTRODUCTION:

Physical activity is prescribed by physicians and sport scientists as one of the most effective methods for prevention and treatment of obesity, hypertension, diabetes, coronary heart disease, and psychological conditions such as anxiety and depression. Exercise is also recommended to improve the quality of life by living more healthily and actively, and "feeling good" about oneself. The following sections will discuss the risks of inactivity, exercise programmes, and the effects of exercise on body composition, self-esteem, and body image, especially in relation to women.

THE RISK OF INACTIVITY:

Inactivity is considered to be the main cause of obesity (Katch & McArdle 1993; Wilmore & Costill 1994; Epstein & Wing 1980). Furthermore, the danger of being inactive includes far more than just causing obesity; it is linked with one third of mortality from diabetes, coronary heart disease, and colon cancer (Powell & Blair 1994). Obesity is a major risk factor in many chronic diseases such as hypertension, diabetes, coronary heart disease, and different kinds of cancer (National Institutes of Health Consensus Development Conference Statement 1985). NIHCDCS also indicated that obesity and associated diseases have the highest mortality rates in the U.S.A. and the same has been reported in Bahrain (Musaiger 1990).

Despite the argument that these diseases are not associated with mild obesity (cited in Kissling 1991), new evidence has shown that even a low level of obesity is linked with chronic diseases like hypertension, stroke, diabetes mellitus, different types of cancer, and coronary heart disease

(McArdle et al 1994). Overweight even in the absence of obesity is also considered a health risk factor for certain diseases such as hypertension. This is of great importance, especially, since in the Western world, the prevalence of obesity is increasing both in adults and in children (National Institute of Health Consensus Development Conference Statement, 1985).
Not only obesity and overweight are health problems; underweight and leanness can also be considered to be risk factors. Kushner (1993) suggested that underweight is linked with increased mortality. As has been mentioned earlier, for females a percentage body fat lower than 15% is dangerous, since body fat over this value is necessary for reproductive system function. However, there are female athletes who have a lower level of relative body fat, menstrual irregularity and eating disorder diseases are more common. Thus, a value above 15% and below 30% appears to be a healthy range for women.

Distinguishing between the healthy range of body fat and the ideal value range is of great importance, because today's ideal of thinness especially among women, is not healthy.

It appears that by adopting an active lifestyle, all of the above risk factors associated with obesity can be minimised. Powell and Blair (1994) argue that mortality from diabetes, hypertension, and coronary heart disease could be reduced if physical activity increased. Regular physical activity is used as a treatment of several chronic diseases. Diabetic patients can reduce their blood glucose level by engaging in exercise programmes (Carlucci et al 1991). In patients with high blood pressure, exercise is recommended to reduce blood pressure: according to Shephard (1989) a reduction of about 5-10 mm Hg in blood pressure occurred as a result of exercise. Exercise is also known to increase the high density lipoprotein fraction (HDL); HDL-cholesterol is important to clear the blood stream of excess cholesterol, and to decrease triglyceride levels, helping in the protection against diseases like ischaemic heart disease (Shephard 1989).

Physical activity is often used as a method of weight reduction, in which exercise enhances weight loss through energy deficiency, which occurs when more energy is expended than is consumed. Obesity is a result of energy imbalance and it occurs when energy intake (food) exceeds energy expenditure (exercise): this is called positive energy balance. Losing weight, on the other hand, is a matter of reversing that positive energy balance into a negative one, by decreasing the food intake or increasing the energy output or combining both of them. Unlike other weight reduction methods (e.g. diet alone), exercise is a healthy way of reducing body fat (fat is used as energy), and maintaining fat free mass (muscles). Diet can also result in decreasing body weight, but fat and fat free mass are lost as well. For obese people, combining diet and exercise can give better results, with weight and fat loss and maintenance of fat free mass.

EXERCISE PROGRAMMES:

Exercise is prescribed for various reasons e.g. cardiac rehabilitation, weight reduction, building muscles, cardiovascular endurance fitness. For the treatment of obesity, exercise is always recommended either alone or in combination with caloric restriction, since both produce negative energy balance, and therefore are useful methods for weight reduction. The prescription of exercise includes the number of times per week exercise should be performed (frequency); the time allocated for exercise per session (duration); the amount of exercise(intensity); and the type of activity (mode).

Several organisations and researchers have designated exercise programmes appropriate for individuals as well as for certain situations such as cardiac rehabilitation. Among these is the American College of Sports Medicine (ACSM) 1991, whose exercise guidelines are followed by many investigators in the field of sport and exercise science (Sharkey 1990; Wilmore & Costill 1994; McArdle et al 1994). For health, as well as for weight reduction purposes, ACSM recommended a continuous aerobic exercise programme that uses large muscle groups and emphasises developing endurance to strengthen the heart muscles, the lungs, and the vascular

system. Recommended activities therefore include: walking; running; swimming; skiing; and aerobic dancing classes. It is also advisable to use resistance or weight training exercises for weight loss, since these kind of exercises produce a negative energy balance as well as maintaining or even increasing lean body mass. Thus weight or fat will be lost without any reduction in lean body mass (ACSM 1991). The goal of exercise for weight reduction should be focused on using body fat as a source of energy, while muscle (LBM) should be maintained. A reduction in LBM is not healthy and can slow down the resting metabolic rate.

A frequency of 3 to 5 days per week is often recommended for health related fitness (Wilmore & Costill 1994, ACSM 1991), although for low fitness, 2 days per week have improved cardiorespiratory fitness (Williford et al 1993). The prescribed duration of the exercise session is dependent on its intensity. For high intensity sessions, a short duration is recommended, and for low or moderate intensity sessions, longer durations are advisable, since high intensity exercises can not be tolerated for a long time, especially for individuals of low fitness. Exercise duration ranging from 15 to 60 minutes is therefore recommended, with adjustment based on exercise intensity (ACSM 1991).

The American College of Sports Medicine (1991) recommended an exercise intensity of 40 to 85% Vo_2 max or 55 to 90% of maximal heart rate, to improve health as well as fitness level. Research has shown that even with a low amount of exercise, cardiovascular fitness improves, especially in sedentary and older women (cited in Williford et al 1993). The American College of Sport Medicine advises that it is safer to start with low intensity and progress gradually towards higher intensity and/or longer duration, depending on participants' health status and level of fitness. Although these recommendations are important, there are issues which need to be considered in planning exercise programmes, especially for sedentary people. Sedentary people may be reluctant to engage in exercise programmes, because some recommendations are demanding and arbitrary;

some claim that there is no gain in fitness or no weight loss if the intensity of the programme is less than 50-70% Vo_2 max. The message should be that any amount of exercise is beneficial and better than not exercising at all. Shangold and Mirkin (1994) argue that sustained participation in any kind of programme is the most important aim in planning exercise programmes. ACSM suggested that exercise guidelines should be flexible and adjustable in order to meet individual needs. Wilmore and Costill (1994) confirm that some people can get benefit from very light exercises, while others need a more intense programme for benefit to occur.

EFFECTS OF EXERCISE ON BODY COMPOSITION:

The effects of exercise on body composition can be summarised in three main categories: first, a reduction in both absolute and relative body fat; second, no change or a slight increase in lean body mass; and third, no change or a slight decrease in body mass.

Wilmore (1983) reviewed 55 studies conducted on male and female subjects, on the effects of exercise on body composition. These exercise programmes ranged from 6 to 104 weeks. Pre and post programme data of all the studies indicated small changes in the three components of body composition: body weight decreased slightly (ranging from - 5.7 to + 1.4 kg); there was a small reduction in percentage body fat (on average - 1.6%), and a small increase in lean body weight. Wilmore suggested that the magnitude of these changes relies on the frequency, duration, and intensity of the programmes. Sharkey (1990) suggested that longer duration exercise improves fat mobilisation. McArdle et al (1994) related the greater loss in fat from longer duration exercise to the associated greater calorific (i.e. energy) expenditure. They cite a study that confirms that longer duration sessions of exercise are more effective in fat loss.

It is also suggested that the magnitude of body composition changes depends upon the initial (pre-programme) body weight and body fat. Several studies support the assumption that fat people lose weight and fat more

readily than thin people (Forbes 1991; Franklin et al 1979; Zviglick & Kaufmann 1976).

Franklin et al (1979) studied two groups of middle aged women (29 to 47 years). The groups were divided according to their percentage body fat, that is a normal weight group (< 30%) and an obese group (> 30%). The programme consisted of a 12-week moderate conditioning programme with intensity 75% Vo_2 max. Body composition changes included a significant reduction in body mass for the obese group only (- 2.56 kg, $P < 0.001$). Body fat decreased in both groups but with a greater reduction observed in the obese (the reduction in percentage body fat in obese was - 1.8% with $P < 0.001$, compared to - 0.8% in the normal weight subjects with $P < 0.05$). Fat free weight was not changed in either group. This study supports the above suggestion that the magnitude of body composition change is related to initial body fat. Because obese people are fatter than non obese people, when an obese person performs the same task as the thin person such as climbing stairs, because the absolute workload is higher for the obese person, therefore the energy expenditure is higher, they burn more calories. This can explain why obese people lose more fat than their thin counterparts.

This assumption that the initial level of fat can influence the magnitude of changes in the body has been examined and confirmed on male subjects, but since there has been limited research conducted on women, it is not clear whether this is true for women, although it seems likely.

Westerterp et al (1992) studied males and females aged 28-41 years who engaged in a long-term exercise programme (44 weeks). The male and the female groups were comparable at age, BMI, and activity levels. Both males and females showed alterations in body composition, although males lost more fat mass than females (- 3.8 kg, and - 2 kg respectively) and gained more fat free weight than females (+ 1.6 kg, + 1.2 kg respectively). During the second half of the study, females increased their energy intake, while males decreased their intake during the same period (energy intake was

measured from a 7 day dietary record) (Westerterp et al 1992). This study did not indicate whether these differences in body composition changes between males and females were due to sex differences or to the relationships between energy intake and energy expenditure. On whether fat weight loss was attributed to the initial body fat, Westerterp et al reported that, in men only, fat weight was significantly correlated with the initial percentage body fat ($r = 0.92$, $P < 0.001$). Since food intake was higher in female subjects, which obviously influenced the magnitude of the changes in their body weight and fat, this study revealed that the differences between males and females regarding body composition changes from exercise, could be attributed to the females' higher food intake. Furthermore, it should be noted that women generally have smaller body size than men which will make them expend less energy than men when performing the same task.

In recent years body composition changes from exercise have been well documented for both younger and older subjects, and for female populations. College-aged females showed a significant decrease in body fat (from 25 ± 6.8% to 21 ± 6.3%, $P < 0.01$), with no change in body weight, after a programme of low impact aerobic dance exercises for 12 weeks (McCord et al 1989). Compared with a matched control, a significant decrease in percentage body fat (- 1.2%, + 0.6%), suprailiac skinfold (- 0.3 mm, + 7 mm), and abdomen skinfold (- 0.3 mm, + 1.5 mm) was reported for older female subjects aged between 35 to 70 years, after a programme of walking and jogging for 24 weeks (Schaberg-Lorei et al 1990). Bergman and Boyungs (1991) studied the effect of a 10 week indoor walking programme, on women aged between 40 and 82 years and found no change in body weight, although there was significant reduction in percentage body fat (from 32 ± 0.76% to 30.9 ± 0.84%, $P < 0.005$) and fat weight (- 0.8 kg, $P < 0.005$), and increase in lean body mass (+ 0.6 kg, $P <. 0.05$) (Bergman & Boyungs 1991). It should be noted that these studies used light to moderate intensity exercises, which can produce changes in body composition and be effective especially for sedentary persons and those with a low level of fitness.

From these studies, changes in body composition, particularly in body fat, seem to be more pronounced than changes in body weight. Nevertheless changes in body fat are not of great magnitude, though they are significant statistically. This should not discourage people from taking part in exercise, but:

> Even though the immediate effects are limited, the cumulative effect of small changes in physical activity may have beneficial consequences over the long-term. (Brownell & Stunkard 1980, p:302).

Other benefits can result from exercise. In addition to the medical and health benefits, the most pronounced effect of physical activities is improvement in fitness status, depending on the intensity and the duration of the programme, with more strenuous activities showing more improvement (ACSM 1991).

In addition to the benefits and adaptations that take place during exercise, there are other adaptations following its cessation. These include the continued elevation of metabolism after exercising, which means that the body is still expending more calories than prior to exercise: this extra expenditure of energy can result in further alterations in body composition. The time required for metabolism to return to its pre exercise level depends on the intensity and duration of the programme. In light to moderate exercises like walking, it takes up to several minutes, whereas it requires hours (12 to 24) to return to pre exercise condition for those who run a marathon (Wilmore & Costill 1994).

Whether these alterations in the body are maintained, or disappear after a period of time, has not been fully investigated. Only one such study was found: MacKeen et al (1983) followed up data from a previously mentioned study (Franklin et al 1978) after 18 months. No differences between pre exercise and follow up values were found, indicating that after 18 months, subjects had returned to their pre-exercising status. It should be noted that although 40% of the normal weight subjects and 33% of the obese continued exercising, none of them maintained what they gained from the exercise programme. Further studies are required in this area.

Last but not least, exercise adherence is of great importance in getting beneficial results from exercise. It has been reported that the rates of dropout among overweight as well as normal weight people is high (Brownell & Steen 1987; Robison & Rogers 1994). There are many factors influencing exercise adherence, including increase in the intensity, duration, and frequency of any exercise session. Robertson and Mutrie (1989) found that as intensity, duration, and frequency of exercise increase, adherence decreases, and that it is important that exercise programmes plan to meet every individual's needs. Accordingly, in planning any exercise programme, increasing the likelihood of adherence must be a primary goal: activities that are preferred, enjoyable, and do not produce injuries should be included.
Weather conditions must also be taken into consideration, especially in a hot country like Bahrain. The climate issue might not be so important for increasing adherence to exercise in Western countries, but the climate in Bahrain is one of the most effective barriers discouraging people from taking part in exercise and maintaining activity habits. It is therefore useful to programme outdoor activities in the evening time. In addition, alternative activities (e.g. swimming) should be available when the weather gets hotter.
Finally, when women are the focus, traditional and religious matters should be respected: training locations must be provided for women only, and no pressure should be placed upon them in terms of the way they dress, other than concern for safety and comfort.

EFFECTS OF EXERCISE ON SELF-ESTEEM:

Self-esteem is a term often used to indicate psychological well-being (Sonstroem 1984). Numerous studies report that exercise programmes improve self-esteem in male and female participants (Eide 1982; Shephard 1983; Trujill 1983; Sonstroem 1984; Berger 1988; Netz 1988; Sessoms 1988; Raglin 1990; Carlucci et al 1991; Ford et al 1991). After reviewing 16 studies, Sonstroem concluded that exercise has a positive effect on self-esteem scores, but "it is not known why or in what manner" (Sonstroem 1984,p:150).

The challenge for researchers is to find out what "agents" are responsible for changes in self-esteem.

It has been speculated that there are other variables (physiological or psychological) acting as links and mediators between exercise and self-esteem, which could be responsible for changes in self-esteem through exercise. One explanation could be improvement in psychological variables i.e. body image; anxiety; mood state; feeling of mastery; and physical competence: another could be positive changes in physiological variables such as fitness, body composition or health.

To clarify this linkage, correlations between exercise induced self-esteem enhancement and improvements in other variables (psychological and/or physiological) can be studied. There is a range of research dealing with this kind of correlation, in which physical fitness aspects and body composition measurements are frequently used as physiological mediators, while body image and the individual's subjective estimation of his/her physical fitness level are considered as psychological mediators. It should be noted that although exercise effects on body image will be reviewed separately, some references will be made to body image because of its relevance to self-esteem and exercise relationships.

It is useful to consider again the multidimensional hierarchical construct of self-esteem proposed by Shavelson et al (1976), where global self-concept is at the apex, and one of the second level components is the physical self-concept, which is further divided into two subareas of self-concept: physical ability and physical appearance. Shavelson et al (1976) suggested that changes are more pronounced in components located at lower levels of the hierarchy than in those at higher levels. Therefore changes in physical appearance and physical ability could be visible and could influence changes in the higher order (physical self-concept and general self-concept). Body image scales (e.g. Body Cathexis Scale) are used to measure the physical appearance sub-area of general self-concept. According to Shavelson's

suggestion and the earlier discussion on the positive relationships between body image and self-esteem, one can speculate that changes in body image due to exercise participation can influence changes in self-esteem.

Hawkins (1981) pursued that speculation when he studied females' self-esteem (self cathexis) changes through an exercise programme (24 sessions of walking/jogging), and related these changes to those in body cathexis, physical fitness and body composition. Pre and post tests results indicated positive improvements in all of the above variables. Significant association was also found between improvement in body cathexis and self-cathexis. No significant associations were found between physical fitness and body composition measures or those of body and self cathexis. To examine the effects of body image on self-esteem, the author divided his sample's body cathexis scores into high and low groups and compared them to self cathexis scores by using the Mann-Whitney U test. The results were significant at ($P < 0.05$), indicating that improvement in body cathexis is associated with improvement in self-cathexis (Hawkins 1981).

Some investigators suggest that self-esteem improvement through exercise is related to improvements in physical fitness scores (Folkins & Sime 1981). However, the relationship between self-esteem and physical fitness has not been definitely confirmed. Balogun (1987a) found no relationship between self-esteem and physical fitness measures of college-aged females.
The correlational results, along with the result of the multiple regression analysis, used to find out if fitness parameters can be considered as a predictor of self-concept, suggested that the five fitness tests used were a significant indicator of body image but not self-esteem. From the series of correlations, it seems that body image acts as a mediator between self-esteem and physical fitness, supporting Shavelson et al (1976).

According to Heaps (1978), the absence of correlations between self-esteem and some of the physical fitness indices (e.g. endurance) can be related to lack of positive feedback. Heaps suggests that positive feedback, either from physical measurements or social information, is an important factor in enhancing the relationships between self-esteem and physical fitness. Heaps adds that the way feedback (positive or negative) is given can influence cognitions about physical potential and therefore can influence self-concept (Heaps 1978). Balogun (1987a) relates this to the results of his study, which showed that variables correlated with self-esteem such as flexibility and body composition, are those variables in which any changes are noticeable (e.g. loss of weight). In other words, information about changes is assimilated (Balogun 1987a).

Several authors report that enhancement of self-esteem through exercise is likely to be influenced by subjective estimation and perception of physical fitness level, rather than the actual fitness level itself (Neale et al 1969; Heaps 1978; Leonardson & Gargiulo 1978). Leonardson and Gargiulo (1978) found significant correlations between self-concept and perceived physical fitness. Perceived and actual fitness were also found to be related. Furthermore, Leonardson and Gargiulo (1978) reported no significant correlations between actual fitness and self-concept. Similar correlational findings were reported by Heaps (1978) and Neale et al (1969). Recent data concerning more specific aspects of perceived physical fitness and their relations to general self-esteem are presented by Delignieres et al (1994). In this study, a self-appraisal of physical capacities questionnaire consisting of five scales: endurance, strength, flexibility, body composition, and fitness (Borg et al 1972) and self-esteem inventory (Coopersmith 1984) was used to assess aspects of perceived physical fitness and general self-esteem, respectively. The findings indicated significant correlations between self-esteem and: perceived endurance ($r = 0.36$), perceived strength ($r = 0.37$), perceived body composition ($r = 0.21$), perceived physical fitness ($r = 0.42$), and perceived physical worth ($r = 0.39$) (Delignieres et al 1994).

Because global self-esteem is a stable construct (Shavelson et al 1976), it is not surprising that no correlation between improvements in physical fitness and self-esteem has been confirmed. A correlation would be more likely between physical fitness and the lower dimension of self-esteem related to physical activities, namely physical self-esteem. Brown et al (1982) examined this issue by employing two subscales of the Tennessee Self-concept Scale: physical self and total positive self-concept. Other measures included in this study were physical fitness (aerobic capacity), and skinfold thickness. The subjects were experimental and control groups of women, who engaged in aerobic dance classes (body conditioning). Results showed improvements in physical self-concept. Analysis of variance indicated significant differences between experimental and control groups in physical self-concept ($P < 0.02$), and aerobic capacity, as measured by 1.5 mile run test ($P < 0.01$). Although body composition variables changed, values of changes were not statistically significant. Brown et al (1982) found for an experimental group, physical self-concept was strongly related to fat weight ($r = -0.43$, $P < 0.001$), and run time ($r = - 0.49$, $P < 0.001$): for the control group, significant correlations were found between the same variables, although the values of correlation were smaller ($P < 0.05$) than for the experimental group (Brown et al 1982).

A similar study was conducted by Marsh and Redmayne (1994) to investigate the relationships between physical fitness components and matching components of physical self-concept of adolescent girls aged between 13 and 14 years. Measurements of physical fitness components consisted of the following tests recommended by Fleishman (1964) and Cooper (1968): endurance, balance, flexibility, static strength, and explosive strength/power. Physical self-concept components, measured by scales developed by (Sutherland & Marsh 1982; and Marsh 1990) included: physical appearance, physical ability, balance self-concept, flexibility self-concept, endurance self-concept, and strength self-concept. The authors reported correlations between the components of the two variables (physical fitness and physical

self-concept) ranging from r = - 0.052 to r = 0.643. Significant correlations were found between endurance self-concept and endurance fitness (r = 0.643), strength self-concept and: static strength fitness (r = 0.442); explosive strength fitness (r = 0.441), flexibility self-concept and flexibility fitness (r = 0.211). Further, the general physical ability scale was found to be correlated with all the fitness measures except balance, and also with all components of physical self-concept. The authors pointed out that their findings should be interpreted with caution due to possible interference of other variables such as physiological and psychological changes accompanying adolescence (Marsh & Redmayne 1994).

In relation to this last point, it must be noted that although the majority of the studies cited in this review support the notion that self-esteem and exercise relationships are mediated by psychological variables (i.e. perceived physical fitness, and body image), this conclusion has been reached merely from correlational analysis methods. As Shavelson (1988) points out, correlations cannot be equated with causal relationships. Thus if other variables are considered (social, personal) and further analyses are carried out, other explanations for exercise and self-esteem relationships may be found. Sonstroem (1984) states that the mediator could be any of the variables which are considered to be important to the individual. In this respect, the absence of relationships between objective measures of physical fitness and self-esteem could be related to the fact that physical fitness does not have the same level of importance for everyone (Sonstroem 1984). As mentioned earlier, Rosen and Ross (1968) confirmed that in order to strengthen the relationships between body image and self-concept, the importance of body parts to the individual should be considered. The importance an individual attaches to exercise can affect the rate of participation in exercise programmes. Sessoms (1988) found a significant correlation between women's perceived importance of exercise and the frequency of sessions. Perceived importance of exercise can be measured by scales such as The Perceived Importance Profile (Fox 1990a), which was designed to accompany The Physical Self Perception Profile (Fox 1987), which measures

the importance of physical self perception components (condition, sport, strength, and body attractiveness).

Psychological alterations consequent to participation in exercise programmes are believed to be related to the initial fitness level of participants (prior to the exercise programme), in which low fitness individuals show more improvements than high fitness ones (Eickhoff et al 1983). Eickhoff et al studied the effects of a 10 weeks aerobic dance programme on psychological (self-concept) and physiological (resting and exercising heart rates; and skinfold thickness) variables on a group of women (experimental and control). The exercise programme was carried out three days per week for 50 minutes per session. Self-concept was measured by two subscales of the Tennessee Self-concept Scale (Physical Self-concept and Total Positive Self-concept). Resting and exercising heart rates were determined by a submaximal fitness test on a bicycle ergometer. The pre and post tests indicated significant changes for the experimental group in the physiological variables only, resting heart rate (- 6.5 beats.min^{-1}); and sum of skinfold thickness (- 8.5 mm), as compared to the control group. To examine whether initial fitness level influenced the amount of change, Eickoff et al divided both experimental and control subjects into low and high fit groups according to their pre-test exercising heart rates. The results of this second analysis revealed that only the low fit experimental subgroup showed improvements in physical self-concept, sum of skinfolds and exercising heart rate (differences between pre and post tests were significant at $P < 0.05$) (Eickhoff et al 1983). The findings of Eickhoff et al (1983) are consistent with the findings of Forbes (1991) and Zviglick & Kaufmann (1976), who reported that physiological alterations are more pronounced in people who start exercise with higher levels of percentage body fat (see earlier discussion of exercise effects on body composition).

On the other hand Neale et al (1969) reported no significant differences in general self-esteem between high fit adolescent boys and low fit boys.

There are no clear explanations on several issues related to the findings. For example, which of these exercise principles (intensity, duration, frequency, and mode) contribute to changes in psychological variables , and are exercise guidelines addressed to promote changes in body composition effective also in producing psychological changes? Psychological research has been equivocal in addressing the issue of how much, how often, and how long exercise is needed for enhancing body image and self-esteem. In the mean time, however, Sonstroem (1984) has recommended the use of exercise guidelines provided by the American College for Sport Medicine to engender minimal changes in self-esteem.

It has been suggested that the type of exercise used influences on self-concept changes from exercise (Hanson and Nedde (1974). It should be noted that most of the studies cited above used conditioning programmes (running) as a tool, while few used weight training programmes. Trujillo (1983) compared changes in self-esteem between two groups of women who underwent two different types of exercise programme (weight training and running). Both groups showed improvement in self-esteem (pre and post t-tests were significant at $P < 0.05$), although the weight training group showed greater gains in self-esteem scores. The lifters showed significant gains in strength (68%), and the runners increased their running distance (+ 1/3 mile) and decreased their resting heart rate (- 3.25 beats). Subjects were also asked to indicate the reasons they participated in these classes: most answered "to get in better shape". This goal was fulfilled, as the post-test measures indicated that 75% of the lifters, and 83% of the runners reported that they felt physically better about themselves, which seems likely to be related to the increase in self-esteem (Trujillo, 1983).

A series of studies conducted by Tucker (1983b; 1983c; & 1984) reported improvements in self-concept measures of male subjects as a result of weight training programmes. These four studies also reported significant gains in

muscular strength. According to Tucker (1991), and as mentioned earlier, improvement in strength is a noticeable variable in bodily change, which can produce positive feedback and therefore improvement in psychological variables. On the other hand, Tucker and Maxwell (1992) found that for females, changes in body mass and skinfold thicknesses were shown to be mediating factors between weight training and improvement in body image and psychological well being. This is understandable, since society places great importance upon women's ideal bodies, which encourages women to be concerned with their bodies and their weight. In summary, both types of programme seem to be effective in self-esteem enhancement, and choice should be left to the exerciser.

No research has yet reached a conclusion on causality of exercise induced self-esteem enhancement. Although most of the researches reviewed indicated changes in self-esteem (directly or through other mediators), it seems that these researches were investigating, beside global self-esteem, several other psychological dimensions which could interfere or confuse the findings (e.g. psychological well-being, mood alteration). In addition several terms were used to refer to the concept "self-esteem" (e.g. self-esteem, self-concept, self-cathexis, self-image), and various instruments were employed to measure it (Self-Cathexis Scale, the Tennessee Self-concept Scale, Coopersmith Self-esteem Inventory, Rosenberg Self-esteem Scale). Most of the studies did not use organised exercise programmes, but relied on the subjects' self reported intensity, duration and frequency of programme, so caution must be used when concluding that exercise can enhance global self-esteem, especially when considering the theoretical framework of self-esteem construct. In this respect, it is worth recalling the earlier review of self-esteem theory, and more specifically, the notion that global self-esteem is a fairly stable entity. One would not expect significant change in the general construct, and thus change could be related to more specific lower level components e.g. social or physical self- esteem. It is therefore advisable to include both general and more specific measures of self-esteem (Sonstroem 1984).

Fox's (1987) Physical Self Perception Profile (PSPP), was used by Caruso and Gill (1992) to investigate the effects of exercise on physical self perception of college aged females. Two types of exercise programmes (10-weeks, 3 days per week, for 50-minutes per session of weight training and aerobic exercise) were used. Other psychological and physiological variables were included: fitness (strength and physical work capacity); body composition (percentage body fat); global self-esteem; and body cathexis. Both groups showed significant improvements in physical self perception subscale scores (sport competence, physical condition, body attractiveness, and physical strength) ($P < 0.05$), and in fitness scores and body composition measurements ($P < 0.05$). However, no significant improvements were found in global self-esteem and body cathexis scores. Correlational analysis (Pearson correlations) revealed that moderate correlations existed between physical self worth and the following: sport competence ($r = 0.52$), physical condition ($r = 0.65$), body attractiveness ($r = 0.67$), physical strength ($r = 0.41$), global self-esteem ($r = 0.76$), and body cathexis ($r = 0.68$). These findings support the hierarchical structure of the Physical Self Perception Profile, in which Fox (1987), and Fox and Corbin (1989) suggested that physical self-worth acts as a mediator between global self-esteem and the four subscales of physical self-perception. Caruso and Gill reported moderate correlations between PSPP subscales and the related physiological variables: for example, the body attractiveness subscale correlated significantly with body weight ($r = - 0.52$, $P < 0.01$) and percentage body fat ($r = - 0.37$, $P < 0.05$); and the physical strength subscale correlated with strength fitness tests (e.g. bench press). This study confirms that weight training and aerobic exercise programmes are both effective in enhancing physical self perception, physical fitness, and body composition of college-aged females (Caruso & Gill 1992).

In conclusion, more studies to examine the effectiveness of the Physical Self Perception Profile in exercise settings are needed. It appears that studies in the area of psychological adaptations to physical activity have concentrated

on the relationships between physical measures and psychological ones. Other mediators could interact between them, for example social factors. In Bahrain, as in many societies, sport is male defined, and women are often not welcome. Therefore, when women do succeed in this area, it is , for them, "a dream come true" and a triumph over social pressures. Taking part in sport in Bahraini society could be one of the most important issues in enhancing women's psychological well-being.

A list of possible "agents" interacting between exercise and self-esteem has been provided by Sonstroem (1984): the list includes physical, social, personal, and psychological factors, for example goal achievement, social experiences, reinforcement by significant others. The question is to what extent these factors can be controlled or accommodated when treatment such as exercise is used in research, and more investigation in this area is needed.

In addition, for each individual there are personal reasons for participating in an exercise programme. In a study conducted by the researcher and colleagues on Bahraini women (Hassanain, Sayar, & Al-Ansari 1992, unpublished paper), about 20 different reasons were listed by the subjects, including: to improve physical fitness; to control and reduce weight; to improve general health; to occupy their leisure time; to get into better shape; to make friends; to enhance self-satisfaction; to follow the teaching of Islam (being active and healthy is encouraged by Islam); and seeking a better, a youthful, and a longer lifestyle. The Bahraini women identified physiological, psychological, sociological, and religious objectives, which implies that in planning exercise programmes for this group of women, their reasons for exercise should be taken into account in order to engender positive results related to their needs. These reasons once known could help in discovering additional mediators, specific only to the group studied, between exercise and changes in self-esteem.

EXERCISE EFFECTS ON BODY IMAGE:

Body image, as one of the subareas of self-concept (Shavelson et al 1976), is liable to direct change through participation in exercise (Shephard 1983). It is also the case that improvement in body image influences improvement in self-esteem (as discussed in the previous section). Because contemporary societies place so much emphasis on women's bodies and physical appearance, women more than men are preoccupied with their weight and body image (Dolan et al 1990; Kissling 1991; Wooley & Wooley 1885). In Western cultures the ideal of thinness has become a dream of younger and older women (Rozin & Fallon 1988; Lamb et al 1993), pre and post-adolescent girls (Brodie et al 1994), athletes and non athletes (Davis 1992), and women from various ethnic groups (Dolan et al 1990; Ford et al 1990). Most of the women in these studies reported dissatisfaction with their body image, perceiving themselves to be heavier than their ideal and needing to lose weight.

The ideal of smaller body size among women has been reported by Jourard and Secord (1955): women in this study reported dissatisfaction with their weight and the sizes of their hips and waist, preferring smaller sizes. On the other hand, they preferred larger bust sizes. In fact, this dissatisfaction with body image and the desire to lose weight is believed to be the main cause of eating disorder diseases (Dally & Gomez 1980; Garner et al 1980; Lamb et al 1993; Percy & Lautman 1994), and according to Jourard and Secord (1955) is indirectly responsible for causing anxiety and insecurity among women.

Exercise is known to alter body composition by reducing body fat and toning the muscles (discussed earlier). It is reasonable to expect that consequently, perception of one's body will be altered as well. Losing weight and changing body shape is ranked as the first and the most important goal for women in exercise (Cash et al 1994; Redican & Hadley 1988; Theodorakis et al 1992; Trujilo 1983). Cash et al stated that women exercising for weight

management reason were found to exercise more frequently: these women also reported dissatisfaction with their bodies (Cash et al 1994). Several studies have reported that exercise induced positive changes in body image, as measured by the Secord and Jourard's (1953) Body Cathexis Scale (Chwast 1978; Joesting 1981; Tucker 1985; Salusso-Deonier & Schwarzkopf 1991). Improvement in body image is thought to be associated with changes in physical fitness status. Correlational data indicates that positive and significant correlations exist between body-image barrier scores and physical fitness scores for high school females ($r = 0.42$, $P < 0.005$) (Armstrong and Armstrong 1968). Knowledge about level of physical fitness is believed to be an important factor in enhancing body image. Balogun (1987b) investigated whether feedback about physical fitness level can enhance women's body image, with 45 female students enrolled in a health related course: the study took the following sequence: body cathexis was measured first by applying the Body Cathexis Scale (Secord & Jourard 1953). A physical fitness test, including muscular strength and endurance, body composition, aerobic capacity, and flexibility, was administered over a 3 week period. After each test, the subjects were informed about their fitness level; in the fourth week, body cathexis was measured again. Pre and post test showed significant differences in body cathexis scores ($P < 0.01$). It should be noted that the subjects were not involved in any physical training session during the period of the study, which indicates that improvements in body cathexis occurred as a result of the feedback received by subjects about their physical fitness levels (Balogun 1987b). A previous study (Eickhoff et al 1983) showed that only those women who started training with a low fitness level, reported improvement in physical self-concept. This low-fit group also reported reduction in total skinfold, and improvement in physical fitness scores. It should be noted that this group not only started training with lower fitness scores, but also with lower scores in physical self-concept and total skinfold. Tucker and Maxwell (1992) have also found that women with low pre-test scores in body cathexis, physical fitness and with more body weight showed more improvement in body cathexis .

There is no clear explanation of this phenomenon. It could be due to the fact that people who start training with low level of physical fitness, low scores in psychological variables, and higher values of skinfold thickness and body mass, have more room to show improvement than those who start with higher physical and psychological conditions (Tucker & Maxwell 1992). Or it could be due to "response distortion" e.g. social desirability; in which subjects' responses were in agreement to what is socially acceptable (Sonstroem 1984). Additionally, it could be related to the exercise programmes themselves, in which those programmes were effective only on people with low physical and psychological scores. More research is needed.

There is no doubt that losing weight, reducing body fat, and toning the muscles in the body are noticeable changes, which according to Heaps (1978) can act as positive feedback. As discussed earlier, positive feedback can enhance psychological variables e.g. self-esteem and body image. Tucker and Maxwell (1992) suggested that weight training programmes are effective in providing positive feedback through noticeable improvements in body strength and body shape. Tucker and Maxwell conducted a study on a group of 60 women on a 15 week weight training programme. Another 92 females acted as control group. Body cathexis and general well-being were measured twice for both groups: and muscular strength and skinfold thickness of the experimental group were measured. After the completion of the programme, the experimental group showed significant improvement in: body weight (- 1.75 pounds); 29% increase in the total muscular strength (bench press, leg press, and arm curl); body cathexis and general well-being (pre and post test differences of the experimental group were significant at $P < .0001$, as compared to the control). To discover which variables could be used as predictors of body cathexis changes, the authors employed a stepwise multivariate model which revealed the following variables: pre test scores of (body cathexis, weight, height) and post test total skinfold. Thus, women who improved most in body cathexis were those with lower pre-test body cathexis scores, greater pre-test body weight, shorter in height, and

lower post-test skinfold thicknesses (Tucker & Maxwell 1992). This indicated that, for women, improvements in body composition are associated with improvement in body cathexis. Exercise programmes that can produce changes in body composition may therefore affect body cathexis.

A comparison study using three different types of exercise programmes (strength development, body building, and jogging) was conducted to investigate the effects of these programmes on males' body images (Ford et al 1991). The jogging group showed the most improvement in body cathexis scores compared to the other groups. On the other hand, Tucker and Mortell (1993) found that middle-aged women engaged in a weight training programme showed more improvement in body cathexis scores (+ 20.7 ± 21.4 points) than women engaged in a walking programme (+ 11.9 ± 17.6 points). The authors found that the weight training subjects improved in muscular strength, while the walking group improved in cardiorespiratory fitness. The differences in body cathexis improvements between the two groups can be attributed to the fact that weight training exercises result in toning and shaping the outer body which may be more important to middle-aged women than gaining cardiorespiratory fitness (Tucker & Mortell 1993).

Several studies have used comparison methods between different groups (e.g. between exerciser and non-exerciser groups) to show the differences in body image between these groups and also to investigate the effects of exercise on body image. Joesting and Clance (1979) compared the body and the self cathexis of male and female runners and non-runners. The male, but not the female runners were found to differ significantly from non-runners in their perceptions of their bodies and themselves ($P < 0.01$). This shows that the male runners perceived their bodies and selves more positively than both the male non-runners and the female runners and non-runners (Joesting & Clance 1979).

The differences between the current and the ideal body shape of male and female athletes and non-athletes were studied by using The Nine Figure Silhouette Scale developed by Stunkard et al (1983) and Hallinan et al

(1991). Both athlete and non-athlete males showed satisfaction with their body shapes. On the other hand, both female groups showed dissatisfaction with their body shapes, as indicated from the significant differences ($P < 0.001$) between their current and their ideal shapes. Women perceived themselves to be heavier than their ideal female figure while men perceived themselves to be lighter than the ideal. The authors did not find significant differences between athletes and non-athletes of both sexes. Hallinan et al indicated that because of the cultural pressure on women to be thin, women, whether they are athletes or not, overestimate their current figure and prefer a thinner body as an ideal, which results in a wider gap between current and ideal body shape, and therefore dissatisfaction with their body image. Davis (1992) suggested that female athletes are at risk of developing eating disorder diseases. He studied females' attitudes towards their bodies and investigated the differences in these attitudes between athletes (representing various sports) and non-athletes. The results indicated that 71% of the athletes reported that they want to lose weight, eventhough one third of them had a BMI value lower than 20. Similarly, 74% of the other group reported that they wanted to lose weight, of these, 9.2% were below the score of 20 in the BMI. 27% of the athletes were on diets, compared to 9% of the control group. Davis (1992) related that to the pressure imposed on athletes to reach a certain level of body fat (body fat is standardised for each sport) in order to improve their performances.

Investigating whether this trend towards thinness is the case with older women, Hallinan and Schuler (1993) compared the body image of exercising and non-exercising older women aged between 66 to 88 years. The authors measured satisfaction and dissatisfaction of body shape by using The Nine Figure Silhouette Scale (Stunkard et al 1983), in which subjects were asked to indicate the figure representing their current shape and the figure representing their ideal shape. The differences between the current and the ideal shape of the exerciser group were found to be significantly different than the non-exerciser ($P < 0.05$). The exercising women reported more discrepancy between their current and their ideal, indicating less satisfaction

with their body shape than the non-exerciser women. To examine age effect on women's perceptions of their body shape, the authors divided their subjects into five age groups. Analysis of variance revealed no significant age effect, indicating that like younger women, older women strive for thinness (Hallinan & Schuler 1993). Davis and Cowles (1991) have also found that there are no relationships between age and dissatisfaction with body shape in both regular exerciser females aged between 14 and 58 years and males aged between 14 and 64 years. The authors found that 80% of the younger women and 70% of the older women wanted to lose weight, compared to 33% of the younger men and 61% of the older men. Age has no effect on women's desire to lose weight, whereas age has a significant effect on men's attitudes ($P = 0.011$): women reported more dissatisfaction with their bodies than did men. Younger and older women and older men reported exercise as important for weight reduction. The findings of this study indicated that not only are women preoccupied with their bodies, but that men pursue a muscular body. The younger male group showed significant correlation between their participation in physical activities and body dissatisfaction ($r = - 0.56$), and between their participation in physical activities and their body focus (how important they feel about their bodies to the general feelings about themselves) ($r = - 0.36$), indicating that the more they participated in physical activities, the more they feel satisfied with their bodies and the more they focused on their bodies (Davis & Cowles 1991).

Exercise intensity, duration and frequency are important factors influencing changes in physiological and psychological variables. However, it is unfortunate that most of the studies reported above have not included an organised exercise programme, so that there is limited knowledge about how or where changes in body image take place.

The literature reviewed emphasized body image changes rather than the exercise programmes themselves. Most of the studies relied on information given by the subjects about their exercise involvement. Therefore, exercise guidelines required to improve body image are not known. It can be

concluded that relationships between body image and exercise are not yet clear, and also that the mediators between body image changes and exercise are not known. However, very few researches included, in addition to the body image variable, other psychological (self-esteem) and physiological (body composition) variables (e.g. Tucker & Maxwell 1992). It is reasonable to speculate that exercise effects on one variable (body composition) influence improvements in the other variables. It is likely that changes in body composition influence changes in body image (Tucker & Maxwell 1992), and changes in body image influence changes in self-esteem (Shephard 1983). Perception and feedback about one's level of physical fitness can also produce changes in body image and self-esteem.

Therefore, it can be summarised that improvements in body composition and in physical fitness level through exercise, on condition that such improvements are perceived by the subject, and are noticeable, can lead to improvement in body image and therefore to improvement in self-esteem. The influence of other variables, especially social influences is more likely. Thus, consideration of social factors alongside psychological and physiological measures is vital in order to understand fully the relationships between exercise and improvements in the different aspects of the body and the self, especially for women.

CHAPTER III
METHODOLOGY

The challenge of selecting and adapting appropriate research methods and approaches for this research was considerable for several reasons: first, the exercise programme was to be developed for a primarily sedentary population; second, there were sensitive issues relating to culture and gender in an Islamic society; thirdly, the multi-dimensional nature of the issues; and last the dominant models of Western sport and exercise science.

> The importance of "gender blindness" in sports science is difficult to overstate, since it has such profound effects on the development of knowledge, to underestimate or ignore the way this male-defined, male-controlled framework influences sports research and knowledge is to fail to recognise the lack of the "objectivity" claimed for sports science (Talbot 1995, p: 10).

The search for appropriate research methods and instruments to be adopted or adapted took considerable time, and many instruments were rejected as unsuitable. Reasons for rejection included questionable validity; the meanings and the concept of the instruments were susceptible to change when translation into Arabic was made; and some were not suitable for use in Bahraini culture (for example photographing women's bodies nude).

The instruments were therefore chosen first, for their validity and reliability when used on different samples; second, for their capacity for modification for this study's samples; and third, because they consume less time and effort, and do not require specialised venues and equipment.

RESEARCH DESIGN:

Since there was so little existing information on the physiological, psychological, and social aspects of Bahraini women's bodies, a two phase exploratory research model was adopted.

The first phase was designed to investigate the following dimensions of Bahraini women's bodies: physiological (body composition), psychological (body image; general and physical self-esteem), and sociological (the effect

The first phase was designed to investigate the following dimensions of Bahraini women's bodies: physiological (body composition), psychological (body image; general and physical self-esteem), and sociological (the effect of Bahraini and Western cultures and Bahraini men's opinion). The second phase focused on the effects of a three month exercise programme on the same dimensions explored in the first phase. Three different groups of Bahraini women were recruited for the two phases of the study.

PHASE I:

The first phase was intended to explore the designated aspects of Bahraini women's bodies within the Bahraini social context. Bahraini women's status has changed over time due to rapid social changes; the rising number of women in education which began during the late twenties; more women taking part in the work force; and Western influences.

Sample groups of two generations of Bahraini women were chosen: one group consisted of older women (50 to 55 years of age) who had experienced the rapid social changes; and a younger group (20 to 25 years of age) constituting contemporary Bahraini women (the characteristics of the sample groups will be discussed later in this section).

The perception of the two generations of women, of the ideal female body were compared. Previous studies had not indicated substantial differences between younger and older Western women in the way they idealised the female body; both age groups appear to be concerned about their bodies and to admire a thin figure. Since there appeared to be no research available on Bahraini women's perceptions of the body, the researcher reviewed Arabic movies (from the 1940s and the 1950s), and some old photographs of Bahraini women (photos belonging to families, friends, friends' relatives, and old magazines), in order to get an idea about the traditional ideal female figure. Arab movie stars (most Egyptian) appeared to have similar bodies to their Western counterparts (ranging from a plump figure to a thin figure with a narrow waist). Since some of the Arab countries (i.e. Egypt) had been colonized by Western countries, they will have been influenced by the

Western ideals. The photographs showed that Bahraini women's bodies in the 1940s and 1950s, were similar to the Arab movie stars' bodies, and dressed in ways similar to Western women. This suggests that the older Bahraini women's ideal figures corresponded with those of the Arab movie stars, which were similar to the Western ideal.

The literature suggests that women's body image is affected by the opinions and attitudes of "significant others". It was therefore decided, for the women who were married (50% of the younger group and 76.7% of the older group), to explore the attitudes of husbands towards their wives' bodies and their perceptions of the Bahraini ideal female body.

PHASE II:

The research design adopted for the second phase (the exercise programme) was a process model, focusing on measurements before, during, and after an exercise programme. The sample group was thus used as their own control, with the time factor (pre-mid-post) as an indicator of changes in dependent variables (body composition, body image, general and physical self-esteem, and physical fitness scores). Whilst with this model changes can be observed, explanation of why such changes occur may be difficult, and factors other than exercise could be responsible for such changes e.g. dieting and lifestyle (Thomas & Nelson 1990). To minimise such interference, subjects were asked to maintain their pre-exercise habits (e.g. lifestyle, diet), so that exercise would be the only change. It was thus intended that changes in body dimensions measured could be argued to be largely attributable to the exercise programme.

Although the more conventional scientific research methods (e.g. control group models) have dominated in exercise science, in examining the effects of exercise, such approaches were inapplicable for this study. An experimental design approach would require employment of random samples (both experimental and control), which would be unattainable in Bahrain for several reasons:

1. In Bahrain the number of women showing interest in exercise, despite the high publicity for such programmes (through the mass media), is very small. This is due to the hot climate, and to the negative attitudes of Bahraini males towards women exercising; the total population is therefore very limited.
2. There are several problems related to the exercise programme planned for this study. First, the location of the programme site (the Bahrain National Stadium), the only suitable place available to the researcher, is located far from the main cities in Bahrain. Secondly, the time of the programme, evening (8 to 9 p.m.) was chosen due to first, the hot weather conditions, and second, because the stadium is occupied during the day time by male athletes.

Therefore it was inescapable that the samples chosen for this part of the study would be opportunity samples - those who were willing to participate in such a programme, having responded to advertisements placed in the local newspaper, T.V, and local radio (see sample selection section for more details).

SAMPLE SELECTION:

PHASE I:

This phase was designed to provide information on how Bahraini women perceive their body sizes and shapes; how they idealise female body size and shape; and how both perceived and ideal data relate to their actual (measured) body sizes and compositions. Men's attitudes toward their wives' bodies, and their ideal female figure were also considered.

The intention was to explore what dynamics (e.g. the process of ageing and/or social changes in Bahrain) influence Bahraini women's body images. Comparisons between older and younger subjects have been used by several researchers (e.g. Rozin & Fallon 1988; Davis & Cowles 1991; Lamb et al 1993) to investigate differences between two generations of men and women in perceptions of their bodies and the preferred ideal female figure.

Furthermore, it was hoped that sample groups comprising older and younger women would help to detect the influences of social change in Bahrain - changes in response to education, wealth, Westernization - which have arguably changed the status of Bahraini women. For example, since the 1930s, Bahraini women have become actively engaged in the process of social reforms by working as teachers and nurses. Being employed made these women and their bodies visible to the Bahraini public, and accordingly, their life style, interest, and their ways of dressing changed. During the 1930s and the 1940s Bahraini women changed their traditional clothes. The traditional way of dressing comprises of: a long-sleeved wide and long dress; a scarf to cover the head (Higab), a transparent material tunic (optional) that has a cut around the neck to cover the long under-dress. In addition, when going out, women wear a cloak (abbaya), which is a long black (silk) garment covering the whole body. Western dress became more popular among Bahraini women during the 1950s and the 1960s. During that time the number of educated and employed Bahraini women increased as did those educated abroad. In the 1970s another shift in Bahraini women's fashion took place, this time from Western dress to Islamic dress. Thus, contemporary Bahraini women of all ages dress in three different ways: some continue to dress in a Western way; others dress in traditional ways; and some dress in an Islamic way which consists of a long wide dress with long sleeves and a scarf to cover the head.

Some people in Bahrain believe that ways of dressing influence whether women gain weight or have a slim body: it is argued that people who wear traditional and Islamic dress do not notice their bodies extending, because their loose dresses permit them to put on weight. In contrast, any weight gain is noticeable when wearing Western dress (tighter dresses and trousers).

It was of great importance that the subjects would complete all the procedures of the research; willing subjects were required. This is particularly important because of the difficulty in identifying committed subjects among Muslim Bahraini women. The difficulty is mainly related to

the involvement of the body composition measurements in the procedures. To clarify, some body measurements (skinfold thickness) require the subjects to wear minimal clothing or, preferably to be undressed to allow access to measurement locations. This situation can cause embarrassment and traditionally is unacceptable among many women in Bahrain. The sample were selected from places to which the researcher has easy access, in order to be able to meet them more than once to establish good relationships, reassure them and to obtain their consent.

This part of the research involved two sample groups of women and three sample groups of men. There were sixty women: thirty younger women aged between 20 and 25 years, and thirty older women aged between 50 and 55 years. The twenty five years gap between these two age groups was intended to allow a clear comparison, as each group had experienced different forms of social change. For example the older women experienced the shift from traditional to Western, while the younger group lived in the era of traditional and religious revival. The intermediate age groups (aged between 26 to 49) were not included since they had experienced both forms of social change.

The younger women were recruited from the staff of the Ministry of Education, the General Organisation for Youth and Sports, the Bank of Bahrain and Kuwait, the University of Bahrain, and through personal contacts. The older women were recruited from the staff of the Ministry of Education and through nomination by members of the first group, who were asked to suggest women from a similar background to themselves. This was intended to allow study of two different generations but with similar characteristics and background.

It should be noted that some members of this group (older women), were among the first to join the work force in Bahrain, and also among the first to be educated abroad (e.g. Lebanon, Egypt, Britain), and perhaps are more non-traditional than their peers. In other words, it is probable that those women represent the first generation of women to be affected significantly by

the social changes in Bahrain and Western influences, including perception of the ideal and the fashionable female body at the time they were young (i.e. travelling abroad and/or mixing with foreigners in Bahrain might be some of the factors behind the shift from the traditional to the Western fashion among Bahraini women).

The process of selecting the two groups of women involved first, sending official letters to the Ministry of Education and some authorities of women's committees in Bahrain. The letters stated the purpose of the study, the procedures to be employed, and the samples required to fulfil the purpose. The researcher made it clear that the data from the study would be treated with the strictest confidence, and the subjects' anonymity would be protected; no individual data would be directly referenced and subjects would be identified with ID numbers. The researcher also reassured, first in writing, and then in person, that her subjects' rights would be protected, i.e. their rights not to participate in this study; their rights to retain their traditional and their religious values (e.g. they would not be asked to perform something against their will); and their well being. Of the authorities which had been contacted, the Ministry of Education was the only one to give the researcher permission for access to its schools, offices and employees. The Ministry provided the researcher with a list of names of its employees (those aged between 20 and 55 years), from which some were selected. Selection was made with the intention of including women from different parts (cities and villages) of the country. First, the researcher made contact over the phone with the superiors of the chosen women (e.g. headmistresses of the schools) and asked for their permission to contact them, and then the women themselves, in which they were informed about the study and what was required from them, after which their initial verbal consent was obtained. Those who rejected participation in the study were replaced by others from the same list of the names provided by the Ministry of Education. After that the researcher visited the women at their place of work and provided them with a full demonstration of the research procedures to be carried out and the instruments and the equipment to be used. This procedure was essential in order for the participants to be fully aware of the measurement procedures

from the beginning, so that their approval would be fully informed. The women's approval was then obtained. The same process was followed for other women who were not employees of the Ministry of Education.

The male sample groups were first, a group of 11 men who were the spouses of the younger married women and 19 men who were the spouses of the older married women; and second, another group of 106 Bahraini married and single men who were recruited from different job settings. The latter group were selected to explore whether any differences in opinions existed, as the former might have been influenced by the presence of their wives.

PHASE II:

In addition to the aspects investigated in section I, this section investigated the effects of a systematic exercise programme on the women's body image, body composition, self-esteem, physical fitness, and the relationships between them. A different sample group from those used in phase I was selected because the involvement of a three month exercise programme with its three time measurements required a sample of women who were able to participate in this programme and would willingly complete its requirements (measurements, training).

An advertisement was placed in local newspapers, TV, and local radio, announcing the availability of a three month aerobic exercise programme for women, describing the place and the time the programme was running and whom to contact. This was an established procedure used by the researcher to announce exercise programmes. Forty five women responded to the advertisement, from which, after initial discussion, eight were excluded. Two were pregnant; one suffered from heart disease (and her doctor recommended her withdrawal); and three did not attend the pre-exercise testing procedures. The remaining thirty seven women formed the sample group for this phase of the study. The sample age ranged from 18 to 43 years. The male group consisted of 19 spouses of this group of women.

The women were requested to enrol on the programme in person, so that the researcher could meet them and introduce them to what was expected of them. The first meeting was spent demonstrating to them the process of measurement and the equipment used. They were then asked to see their doctors to establish a pre-exercise medical check up, and they were provided with a letter explaining to their doctors the purposes of the exercise programme they were about to undertake. It was not the intention of the researcher to exclude any woman with a medical problem, unless their doctors suggested it. The researcher believes that with careful selection of exercises and with individualised sessions of training, in addition to the application of exercise science knowledge, exercise would do no harm for participants with minor medical problems.

INSTRUMENTS: DEVELOPMENT AND APPLICATION:

The process of searching for, developing, and deciding what instrument to use in this research consisted of two stages: first, the available methods were reviewed to decide the research approach and the instruments required; and secondly, appropriate research instruments were selected and modified. These stages were carried out at Leeds Metropolitan University during the years of 1991 and 1992.

Preliminary Literature Review:

Being a pioneer in exploring underlying issues concerning Bahraini women's bodies from psychological, physiological, and sociological perspectives, there was no choice but to rely on Western and North American literature. While it is well established that Western societies have cultural features distinctive from Bahraini Islamic society, they do have great influence on contemporary Bahraini culture.

The literature review had sought insights into the extent of acceptance and use by non-western researchers, of concepts, theoretical frameworks and research methods developed, in and for Western societies. The review confirmed that the terms body image and self-esteem had been used,

especially in recent years, as multidimensional constructs, with more than one instrument being required to measure the various dimensions.

Selection of the Research Instruments:

The selection of instruments was made in the light of the multidimensional theoretical framework adopted for the study; the recommendations and suggestions made by previous researchers; the characteristics of this study's sample groups (Bahraini Muslim women living in a traditionally restricted society); the time and budget allocated for this study; and the researcher's experience in providing physical activity for Bahraini women.

The approach adopted for the study required the employment of several instruments for each construct (self-esteem, body image, body composition). Thus numerous research instruments were used, producing a wide range of research variables. This was inevitable, because the main focus was the exercise programme and changes associated with exercise in the parameters related to the women's bodies (body image, body composition, self-esteem). For example, the hierarchical construct of self-concept (Shavelson et al 1976), where global self-concept is located at the apex, and the more specific dimensions of self-concept (e.g. physical, social, emotional) at lower levels of the hierarchy, suggested that the global self-concept is stable over time and may not be changed, while, the more specific self-concept (i.e. physical) can be changed. Thus it was important to be able to measure global self-esteem, as well to measure the more specific physical self-esteem. The intention was to measure several dimensions of each construct in order to monitor the changes associated with the exercise programme, and to identify at what level the changes took place.

The researcher was aware that employing several instruments could cause boredom and tiredness in the women, especially when measurements had to be taken three times, as with the exercising group. Hence, instruments (questionnaires, and measurement equipment) that were short, simple to administer and understand, and did not require much effort from the subjects were chosen.

Particular attention was paid to the reliability and validity of instruments. With respect to the reliability of psychological measurement instruments (self-esteem, body image), there was no shortage of data. However, according to Wylie (1974), construct validity was less established for the majority of instruments for self-concept, self-esteem, and body image. Construct validity can be obtained from correlating the instrument in question with other instruments measuring the same concept; or by applying the instrument on different subjects (i.e. different age groups); or by applying factor analysis procedures to examine the internal structure of the instrument. Wylie (1974) and Burns (1979) questioned the validity of several psychological instruments which were developed and used only once (mainly by those who developed it). More widely used instruments, particularly if used on sample groups, of different ages and sexes, can be argued to provide some sort of validity.

A crucial issue was the characteristics of the sample groups and the society where they live. The subjects were Bahraini Muslim adult women and the husbands of those who were married, living in a small country, with a very hot and humid climate. Although Islam allows a woman to practise her rights (educational, occupational etc.), there are still traditional restrictions on women in Bahrain, mainly from males: women may not be or feel welcome in sport settings either as participants or spectators.

The research is concerned with two critical issues relating to Bahraini women: women and exercise and women's bodies. Exercise is not considered very important for women in Bahrain (the number of participants in exercise programmes, carried out by Governmental or private sectors, is very small, with most women participating for weight reduction reasons). Women's bodies is not an issue which can be comfortably discussed, especially with husbands.

With regard to body composition measurements, techniques were therefore sought which are valid and reliable; do not impose inappropriate or

demanding requirements from participants (e.g. being submerged as in hydrostatic weighing technique); and were inexpensive and accessible.

Anthropometric techniques (skinfold, circumference, mass and height measurements) appeared to possess most of these characteristics. They are among the oldest and most widely used techniques; their reliability and validity appeared to be high. For example, the skinfold thickness method was shown to be as valid and reliable as, if not more than, other highly sophisticated methods like the bioelectrical impedance technique (Jackson et al 1988; Baumgartner et al 1987; Scott 1988). Anthropometric equipment is affordable and portable, and therefore suitable for field study, with measurements carried out in the women's preferred chosen places - the women's homes, work, the researcher's house or work, or where the exercise programme took place.

The literature review had identified a wide range of measurement instruments, in the fields of psychology and physiology, but not all were suitable for this study. Beside being expensive and not feasible, some of the high technology apparatus used for body composition measurements (e.g. hydrostatic techniques, scanning and X ray procedures) need special laboratories to operate them. According to Wilmore (1984) and Katch (1984), these methods do not add much to what skinfold thickness measurements provide, since most of the available measurement methods do not provide direct measurements of body composition. Information provided by body composition techniques, whether simple like weight and height tables or complicated like scanning and computerised methods, is estimated rather than directly measured. Thus the decision was to use the simpler techniques of anthropometry.

In the area of psychology, several instruments were reviewed but not selected. The Tennessee Self-Concept Scale (Fitts 1965) was not selected for this study firstly, because it is long and time consuming, with 90 questions and 12 scales; secondly, it appeared very culturally specific, having been developed assuming research participants to be Western and Christian and

the language and concepts did not seem to be appropriate for use with Muslim women in Bahrain; and thirdly, there is no available information on its validity on Muslim Middle Eastern or Bahraini women. The Ben-Tovim Walker Body Attitude Questionnaire (1991b) is newly developed, and there are no available data on reliability and validity other than from the authors, so this was also rejected.

The chosen techniques are listed in Table 1:

Table 1

Measurement instruments and techniques

Measurements	Instruments
Body image	a. Body Cathexis Scale (Secord & Jourard 1953)
	b. The Nine Figure Silhouette Scale (Stunkard et al 1983)
Self-esteem	a. Self-esteem Inventory (Coopersmith 1991)
	b. The Physical Self Perception Profile and the Perceived Importance Profile (Fox 1990)
Body composition	a. Body mass (kg)
	b. Height (cm)
	c. Skinfold thickness (mm)
	d. Body girths (cm)
Physical fitness	The YMCA fitness test battery (Golding et al 1989)

The reasons for their selection and process of development and reframing and adaptation are outlined below.

1. BODY IMAGE:

i. Body Cathexis Scale (BCS):

This scale was adapted for this study to measure women's attitudes towards their bodies. The original Body Cathexis Scale (BCS) developed by Secord and Jourard (1953) consists of 46 body parts and processes, although most studies used the 40-item version (Tucker 1981). Respondents are required to rate their degree of satisfaction and dissatisfaction on a 5 point Likert scale, ranging from 1 (have strong feelings and wish change could somehow be made) to 5 (consider myself fortunate). The total rating of the items is used to indicate participants' body cathexis score.

According to Cash and Pruzinsky (1990), body image is a general term consisting of two dimensions; attitudes towards the body; and the perception of the body. Since the Body Cathexis Scale (BCS) was developed to measure women's attitudes (satisfaction or dissatisfaction) towards various parts and functions of their bodies, it seemed appropriate for measuring the attitudinal dimension of body image. It has been widely used by many researchers, on different subjects from different cultures, and has been translated into languages other than English and shown to be valid (Theodorakis et al 1991).

Another reason for choosing this scale is its reported high reliability and validity. Secord and Jourard (1953) reported split-half reliability for the body cathexis scores of 0.78 for males and 0.83 for female college students. Other researchers reported a high reliability coefficient for the scale. For example, Tucker (1981) reported a t-test reliability of 0.87, Theodorakis et al (1991) reported split-half reliability of 0.89, cronbach alpha of 0.92, and a test-retest reliability of 0.90 on Greek women. Balogun (1986) reported a similar value of test-retest reliability (0.89) suggesting that the Body Cathexis Scale is reliable.

The English language version of the BCS was piloted on 30 students, housewives, and professional British women (from Leeds Metropolitan University), who were asked to read over the scale and to comment on the clarity of the language and concepts. The pilot British women reported that some items of the scale seemed vague, with more than one meaning (e.g. "elimination"). Since most of the pilot group of women requested an explanation of the meaning of this item, it was merged with the digestion item. The vagueness of the sex organ item was also of concern, as it includes various organs (e.g. mouth, breasts, and the reproductive organs), and this appeared to confuse the pilot subjects. This item was therefore replaced by a "breasts" item, on the grounds that breasts are the sex organ most apparent in women's appearance and yet are more easy to discuss than

reproductive organs, which are considered more private and often cause embarrassment.

The Body Cathexis Scale was then translated into Arabic, and the translation was reviewed by two Arab physical education professors in order to ensure the clarity of concepts and that the meanings of the BCS items had not changed with translation. The scale was then piloted and factor analysed on 65 Bahraini women who had enrolled in an exercise programme run by the researcher. Four factors were extracted from the 40 items in the scale, accounting for 41 percent of the total variance. The factors indicated that Bahraini samples cathected their body parts and functions as four independent points: physical skills and fitness; overall appearance; facial elements; and upper body parts.

Theodorakis et al (1991), and Tucker (1985) factor analysed the Body Cathexis Scale of Western women in similar ways. Greek women (Theodorakis et al 1991) cathected their bodies as a function of six factors: physical fitness; total appearance; health and skills; face; ears and chin; and extremities. Tucker (1985) reported four factors for his samples: physical skills and fitness; face and overall appearance; miscellaneous items; and weight and lower body.

All three cultural groups in these studies cathected significant components of their bodies as a function of the physical fitness factor and overall appearance factor, though the overall appearance factor was rated differently by the three groups of women. This factor for the Bahraini and the Greek groups focused on body weight and items related to it (e.g. body build, waist, hips). Thus, for these two groups, overall appearance is a function of body weight and shape. In contrast, Tucker's Western group viewed overall appearance as a function of facial appearance.

These differences illustrate some of the cross cultural differences in the way women cathect their body parts and processes (see previous chapter).

ii. Silhouette Choice Method:

Another established research instrument was adapted to measure the other dimension of body image, the perceptual dimension. Stunkard et al (1983), developed nine female figure silhouettes ranging from 1 (very thin) to 9 (very fat). The scale simply measures participants' perceptions of their current and ideal body shape. Since this scale measured only the perception of a nude outline body, additional measures of perceptions of the dressed body were needed. In Bahrain, discussing nude female figures, especially with males, is considered against traditional and cultural values, and some consider it to be against Islamic teachings. It has already been mentioned that clothing contributes to how a person perceives his/her body image (Schilder 1950). Thus, two additional scales of nine dressed female figure silhouettes were developed especially for this study, based on the original scale.

As mentioned earlier, there are three ways of dressing in Bahrain: traditional, Islamic, and Western, although traditional dress is declining, especially among young people, and may only be worn by older females. Thus Bahraini women are identified mainly by two ways of dressing; Islamic and Western. An artist from Leeds Metropolitan University matched the sizes and proportions of the nine female figure silhouettes developed by Stunkard et al (1983) in redrawing them dressed first in Islamic clothes, and second, in Western clothes. Thus, the scales consisted of three sheets each of 9 female silhouettes adapted from Stunkard: a line of nine nude female silhouettes; the same line-up of silhouettes dressed in a Western way (shirt and a medium length skirt); and the same figures dressed in an Islamic way- a long wide dress covering the whole body from the neck down to the ankles, with "higab" covering the hair (see Figure 1).

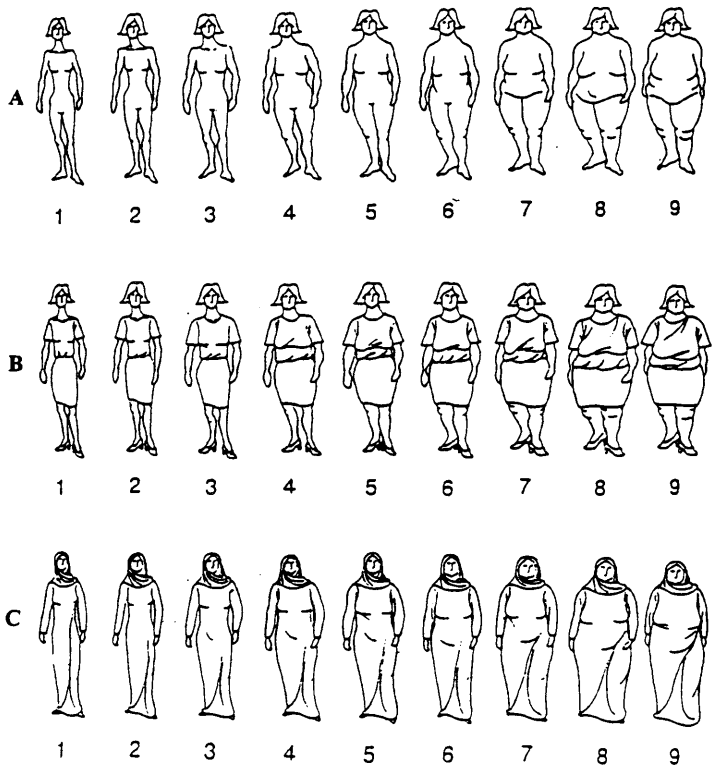


Figure 1: Female figure silhouettes, A: nude; B: Western-dressed;and C: Islamic-dressed.

The respondents were presented with two questions for each sheet, first to indicate the figure that best resembled their current body shape, and second to indicate the figure that best resembled their ideal body shape.

The questions were translated into Arabic, and the female figure silhouettes were rearranged to read from the right to the left (as in Arabic).

2. SELF-ESTEEM:

Since self-esteem is a multidimensional construct, it was desirable to include a global self-esteem measure alongside the more specific, physical self-esteem. The inclusion of global self-esteem can lead to better understanding of the structure of self-esteem (Sonstroem 1984), and relationships between the global self-esteem and its components (Fox 1988). It is also suggested

that using general and specific measures of self-esteem can be useful in studying changes in self-esteem as a result of exercise involvement (Sonstroem 1984).

a. Global self-esteem:

The Adult Form of Coopersmith's Self-esteem Inventories (Coopersmith 1991) was used. It was selected because, in addition to its reliability and validity, its language is simple and understandable, and was unlike other instruments, which use language suitable only for the subjects of their study (e.g. the Tennessee Self-Concept Scale). The issue of language was important, because the scale was to be translated into Arabic. Scientific language may be used by ordinary people in the West (e.g. self-esteem); but the equivalent term in Arabic is complicated and not in every day use. The Coopersmith (1991) SEI was first developed for children, and then modified to be used for adults. The scale consisted of 25 short statements, adopted and modified from the Original School Form Scale developed by Coopersmith (1967). Coopersmith reported a correlation coefficient of $r = 0.80$ between the adult form and the School form.

The original scale (Self-esteem Inventory) developed by Coopersmith (1967) is widely regarded to be an effective measure of global self-esteem, as the factor analysis of the scale yielded one general factor to measure the global self-esteem (Wylie 1974; Burns 1979). It is also reported to be reliable (internal reliability ranged between $r = 0.70$ and $r = 0.88$) (Burns 1979; Coopersmith 1991). The Cronbach alpha reliability of the Adult Form, which was used in this research, was reported to range from 0.78 to 0.85 when tested on college students (Coopersmith 1991).

b. Physical Self-esteem:

Shavelson et al (1976) stated that unlike global self-esteem, which is believed to be stable, the more specific physical self-esteem is less stable and is subject to change (for example as a result of exercise). Thus, the inclusion of a physical self-esteem instrument would add more sensitive information, particularly in relation to the exercise programme and its effects. Physical

self-esteem has usually been studied as a dimension in global self-esteem or self-concept scales (e.g. the physical subscale of the Tennessee Self-Concept scale), and it was not until the 1980s that investigators considered it as a separate entity (Fox 1987). Since this research was concerned with Bahraini women's bodies (physiological, psychological, and sociological), and with the effects of exercise on these aspects of women's bodies and their physical fitness, it was felt that a measure of physical self-esteem that considers the various dimensions of the body as well as dimensions of physical fitness would be useful. The search for such a measure led the researcher to a journal article citing Fox's (1990) Physical Self Perception Profile and the profile was obtained through personal communication with Dr Fox.

The Physical Self Perception Profile (PSPP) shows the physical self is evaluated in terms of four physical factors (subdomains): sport competence, physical condition, body attractiveness, and strength, and one more general factor (domain) - overall physical self-worth (PSW). The Perceived Importance Profile (PIP) measures how important these physical dimensions are to the subjects. PSPP and PIP were chosen for this study because they include the various dimensions of the physical self related to exercise (e.g. strength, body etc.), so that exercise induced enhancement in any dimension could be explored. Not every one participates in exercise programmes for gaining muscular strength or endurance. One of the most important goals of exercise for women is to lose weight, therefore, one could expect that enhancement in physical self-esteem could be related to the dimension of body attractiveness (in Fox's PSPP). Furthermore, the existence of a body attractiveness subscale in the PSPP, alongside the physical fitness subscales (strength, sport and condition) would differentiate between those who exercise for weight loss purposes and those who exercise for other reasons (e.g. physical fitness).

The internal consistency of the PSPP had been reported to be high (cronbach alpha ranged from 0.81 to 0.92), and test-retest reliability correlation coefficients ranged between $r = 0.74$ to $r = 0.89$, indicating that the

scale is reliable (Fox 1990). Other researchers have also reported that this scale is valid and reliable (Sonstroem et al 1992; Page et al 1992; Sonstroem et al 1994). Furthermore, factor analysis of the scale showed that the four factors (sport, condition, body, and strength) are capable of measuring aspects related to the physical self (Fox & Corbin 1989; Fox 1990; and Kirkendall & Malone 1991).

It should be noted, however that PSPP and PIP had been developed on physically active college women, and involved questions related to exercise; in this study these instruments were used on non-exercising Bahraini women (older and younger) to show how they evaluated the physical side of their self-esteem and also to show how important exercise was to them. Therefore, their responses will be valuable in planning exercise programmes for women possessing similar characteristics, e.g. body composition; age; self-esteem etc.

The PSPP was designed to measure the second level of the hierarchical structure of the self-esteem construct suggested by Shavelson et al (1976). The second level of global self-esteem involves physical self-esteem, which is further divided into subdomains. Fox & Corbin (1989) suggest that the hierarchical structure of the concept can be successfully measured when global as well as more specific self-esteem measures are used. Thus the PSPP can provide information about the physical dimension of the self-esteem construct, and if accompanied with a global self-esteem measure, can provide a full measure of the hierarchical structure of the construct.

The PSPP and PIP were first translated into Arabic and piloted on a group of 65 Bahraini women participating in the researcher's exercise programmes, in order to examine the clarity of the language and concepts. As has been mentioned earlier, the terms self-esteem, physical self-worth, and physical fitness terms were considered scientific terms when translated into Arabic. However, since no other equivalent, non scientific Arabic terms could replace the scientific ones, these terms were used as they are (scientific), and explanations were applied verbally by the researcher where necessary.

Questionnaires:

1. Questionnaire Booklet I (for women): see Appendix (I)

This 19 page booklet comprised the 5 adopted instruments (discussed earlier) and 2 newly developed questionnaires:

1. The Body Cathexis Scale (BCS)
2. The Nine Female Figure Silhouettes
3. Self-esteem Inventory (SEI)
4. The Physical Self Perception Profile (PSPP)
5. The Perceived Importance Profile (PIP)
6. The General Information Questionnaire
7. Weight Related Questionnaire.

Constructed Questionnaires (see Appendix I):

Two questionnaires were devised to elicit information not considered by the other instruments which incorporated general information about the women of this study. The first was concerned with general information about the women and included 20 questions concerning their age, the location of the home, marital status, at what age they got married, number of children and their ages, occupational and educational status, car ownership and access to it, whether the women were in any weight control programme (weight reduction, weight maintenance, and weight gain), and if so, what kind.

The second questionnaire sought information on weight and physical appearance, including questions on women's perceptions and estimations of their past, current, and ideal body sizes (i.e. body weight, body height, body overweightness, and body overfatness). Social and cultural aspects of the body image were considered in this section, for example, with whom did women compare their bodies, and who might have influenced their perceptions of being overweight.

The two questionnaires were constructed first in English and piloted on 30 housewives, students, and professional British women (recruited from Leeds Metropolitan University). The pilot respondents were asked to comment on the clarity of the questions and language and their comments were taken into consideration. For example, some suggested reducing the number of open-ended questions, due to people's hesitation about responding to these kinds of questions (because they are long and need time to answer). The questionnaire was then amended and again administered to 15 British women (students and professional women), in order to establish the time required to complete it (12 to 20 minutes).

The questionnaires were then translated by the researcher into Arabic in Bahrain, with advice from two physical education professors, to ensure that meanings of concepts and questions were not affected by translation, and also to make sure that the Arabic translation was clear. The Arabic version of the questionnaire was again piloted with 25 Bahraini women (housewives, and professionals), to be certain that the questionnaires were understandable and clear to them. Some questions were changed to suit the Bahraini subjects. For example, the question related to educational status was formed first to suit the Western pilot subjects (years of schooling). This question was not relevant to Bahrain, where the degree or certificate obtained (e.g. secondary certificate) is a measure of educational status. The time required to finish the Arabic version was found to be dependent on the educational level of the women. The women with higher levels of education required between 10 to 15 minutes, while those with less education required more than that (15 to more than 30 minutes). Furthermore, the less educated women required explanations for most of the questions listed in the questionnaire. Thomas & Nelson (1990) noted that the involvement of another person could affect the respondent answers, so it was decided that the ability to read, write, and understand would be required for women who were to be included in the study.

Questionnaire Booklet II (for males): see appendix (I)

The previous literature review showed how feedback from significant others can affect women's attitudes towards their bodies. For Bahraini married women, the most "significant others" in their lives are their husbands. Therefore, husbands' opinions on the ideal female body and on their wives bodies were considered in this research.

To measure husbands' opinions, an 8 page booklet consisting of three sets of instruments and questionnaires was developed:

1. General information regarding men's ages, occupations, marital status, and educational status and levels.
2. The three sheets of the nine female figure silhouettes described earlier. Each sheet contained two questions, the first asking men to indicate which figure closely resembled their wives' figure, and the second asking them to indicate which figure resembled their ideal female figure.
3. This part consisted of questions concerning men's perception of their wives' weights and heights, their ideal female weight and height, and the description of their ideal female figure.

The men's questionnaires provide information on the husbands' opinions on women's body image; data on the differences between husbands' and wives' perceptions of the wives' body image; and social stereotypes of the ideal female figure among Bahraini men and women.

Body Composition Measurements:

Anthropometric Measurements:

Anthropometric methods of body composition measurement were used in this study due to their reliability, simplicity and validity. The anthropometric measurements obtained included body mass and height; skinfold thickness; and body girths.

Body mass, height, and girths are the simplest and the most reliable measurements and most women are familiar with them. Their inclusion in this research was of great importance: firstly, they were included in the calculations of different body indices utilised in this research i.e. BMI; secondly, most of the multifaceted research reviewed earlier used mass, height, and girth measurements to show the recent trend toward thinness; and thirdly, as this research was designed as a multidimensional study, physiological measurements were taken to be correlated with psychological as well as sociological measures.

The skinfold thickness technique was chosen in this study as it is the most popular indirect method, being rapid, and simple. Furthermore, it can be carried out in the field where the training sessions are conducted. This method has been validated against standard laboratory techniques (e.g. hydrostatic method) and found to be valid (Brodie 1988). From skinfold thickness, body density and hence the percentage of body fat was estimated. Such estimations have shown reasonable validity with prediction errors ranging from 3 to 4 percent of body fat (Brodie 1988; and Jackson et al 1980). However, none of the equations listed in the literature had been previously cross validated on Bahraini women samples.

In order to minimise methodological errors, careful training of experimenters is advisable (Lohman 1988). The researcher is one of the best trained experimenters in Bahrain as she had conducted these measurements on women of different ages and body types (e.g. ranging from obese to thin). However, further anthropometric training sessions were undertaken by the researcher at Leeds Metropolitan University. This training session was run by one of the researcher's supervisors and included theoretical work as well as practice of the anthropometric methods (skinfold, girth, and breadth measurements). The training included:

1. full description and demonstration (first on a skeleton and then on a female volunteer) of the location of the various measurement landmarks included in this study (e.g. subscapular skinfold, waist girth);

2. full demonstration on how to grasp the folds of the skin for skinfold measurements (between the thumb and the index finger), and how much fold is required to be grasped;
3. the application of the measurement equipment on the measurement sites (training involved how much pressure required to be applied to site; how much time needed for the equipment to remain on the site;
4. how to keep record of the readings;
5. calculation procedures.

From skinfold measurements the following estimations were made:

1. The percentage of body fat:

The regression equations developed for women by Jackson et al (1980), and Durnin and Womersley's (1974) were used to estimate the body fat of the women. These two regression equations were chosen due to the high recommendations made by a number of well known researchers in this field (e.g. Wilmore 1990). In addition, these equations represent data (norms) from two different cultures; the Jackson et al equation was developed on American women, whilst Durnin and Womersley's was developed on British women. Therefore, the two methods of calculating percentage body fat were applied in this study for validation reasons. It should be noted that the authors of these two equations utilised different skinfold sites for the calculation of body density and body fat Durnin and Womersley (1974) used biceps; triceps; subscapular; and suprailiac skinfold sites, while Jackson et al (1980) used triceps; suprailium; abdomen; and thigh skinfold sites. However, whilst some sites (e.g. suprailiac skinfold: just above the iliac crest) were used in both equations, their measurement techniques were different. Suprailiac according to Durnin and Womersley is measured by grasping a horizontal fold, while suprailium for Jackson et al is measured by grasping a diagonal fold. These differences in the measurement techniques produced different values of suprailiac skinfold.

2. Fat mass calculated from multiplying body mass by percentage body fat ÷ 100.
3. Fat free mass calculated by subtracting fat mass from body mass.

Measurements:

1. Mass:

The women's body mass was measured to the nearest 0.1 kg by using either of the weighing scales listed below. The women were wearing light clothing, excluding shoes. For those who refused to take off their outside clothes, they were asked to bring their extra clothes separately to be weighed. Clothing weight was subtracted from their mass.

2. Height:

The body standing height was measured to the nearest 0.1 cm. The subjects were measured barefooted using the devices listed below.

3. Skinfold thickness (descriptions of measurement sites are listed in appendex III):

Skinfold thickness was measured by the Harpenden skinfold caliper to the nearest 0.1 mm. With the exception of the abdomen skinfold measurement, all of the skinfold thickness measurements were taken at the right hand side of the woman. The measurements were taken with the woman standing with her feet apart (shoulder width), except for the calf skinfold. The measurement was repeated three times and the mean was recorded. Calculations of percentage body fat and other related variables (i.e. fat mass) were made immediately, and feedback was given to the subjects.

4. Girths:

Body girths measurements were taken with a material tape on the following sites (see appendix IV for description): neck, biceps, bust, waist, abdomen, hips, thigh, and calf. The measurements were recorded to the nearest 0.1 cm. Biceps, thigh, and calf circumferences were measured on the woman's right hand side. For the bust, waist, and abdomen circumferences, the women were asked to breathe in and out, and the measurements were made at the end of a normal expiration.

The equipment used to perform these measurements included: Electronic portable weighing scales, calibrated beam balance for weight measurement, Harpenden anthropometer with 4 extensions for the measurement of women's height, Harpenden skinfold caliper for the measurement of skinfold thickness, a material tape used to measure the body circumferences, and a steel tape used to determine a point midway for some skinfold and circumferences measurements.

Measurement techniques recommended by Lohman et al (1988) were followed. For all the anthropometric measurements the researcher asked the women to wear light clothing.

Each woman was measured in privacy by the researcher. A female assistant was introduced with the researcher to record the measurements as well as to help in some measurements. Some women, especially among the older group, were not comfortable getting undressed (in the measurement sites) to be measured. Thus, despite the sensitivity of the skinfold caliper (it measured to the nearest millimetre), they were not forced to do so, but were measured with their clothes on. Their clothes thicknesses (double fold) were measured with the caliper, and this value was deducted from their skinfold values. The researcher had no choice but to adopt these procedures, as she had no wish to offend these women, since finding subjects from the older age group had not been easy.

PHASE II:

Instruments and Procedures:

This phase was designed to investigate the effects of exercise on body image, body composition, self-esteem, and physical fitness of Bahraini women subjects. Measurements on body composition, body cathexis, body image, global and physical self-esteem, social and cultural factors, and men's attitudes towards females bodies were conducted following the same procedures listed in phase I. These measurements were carried out three times during this phase (pre-mid-post exercise programme). Thus, this phase

included, in addition to the whole measurements listed in phase I, a fitness test and an exercise programme.

1. Fitness Testing:

The fitness test consisted of the submaximal test battery developed by the YMCA of the U.S.A (Golding et al 1989). This test is recommended by the American College of Sports Medicine (1991), and was further tested on sedentary Bahraini women (Physical fitness of Bahraini women, some of the researcher's previous unpublished work) and found to be suitable and not too demanding for them. In addition, the test requires only 15 minutes to be completed, and could be performed in the air conditioned physiology laboratory where the other anthropometric measurements were conducted.

The test battery includes:

a. Cardio-respiratory Evaluation; Bicycle Ergometer Test:

A Monark Ergometer Model 818E was used to assess the cardio-respiratory endurance of the women. The test is a submaximal one which is based on the assumption that the relationship between heart rate and workload is linear; this linearity is assumed to begin at 110 beats.min^{-1}, since this level of heart rate is reported to not be affected by external stimuli (e.g. talking). The women were asked to pedal at 50 revolutions per minutes at three workloads each lasting for 3 minutes. It is suggested that during physical exertion the heart rate takes up to three minutes to stabilise (steady heart rate), and for some people it may take longer than that. Thus, each workload lasts three minutes, in which heart rate was counted at the second and the third minutes. The YMCA recommended that in order to ensure that the heart rate is stabilised, the difference between the second and the third minutes' heart rates should not exceed 5 beats, and if it does, a fourth minute is required. The initial workload was set at 150 kgm and increased gradually according to the woman's heart rate. The YMCA provided a figure (see Appendix II) guiding what workload should be used for certain heart rate response. The woman's heart rate was monitored on the second and the third minute and, if needed, the fourth minute during each workload by using the Polar Sport Tester, Heart Rate Monitor (Polar, Finland). The scoring sheet and the

plotting form (Appendix II) provided by the YMCA were used to record and plot each woman's heart rate against the workloads, and from these two variables and the estimated maximal heart rate value, the following estimations were calculated:

1. maximum workload (kgm/min),
2. maximum oxygen uptake ($l.min^{-1}$),
3. maximum oxygen uptake per kilogramme of body weight ($ml.kg^{-1}.min^{-1}$).

Since these estimations are based on a submaximal test, and on the participant's predicted maximal heart rate, several types of errors are suggested (Larson 1974; Astrand & Rodahl 1977). Such errors which are believed to be related to age, body type, and physiological responses to the test, can cause an overestimation or underestimation in the prediction of maximal oxygen uptake (Vo_2 max). Astrand and Rodahl (1977) found that the standard error of such estimation ranged from 10% to 15%. However, these authors suggested that submaximal fitness test can be a useful measure when used to monitor improvements in cardio-respiratory fitness associated with exercise. In this case, the participant will be her own control, and comparison will be made only between her performances across time (Astrand & Rodahl 1977). In this research, the results of the Bicycle Ergomter Test were only used to study the effects of exercise programme on the women's cardio-respiratory fitness measured at three occasions (pre, mid, and post exercise programme).

b. Flexibility Measurements:

Flexibility is considered as one of the most important elements of physical fitness, and it is often included in test batteries (ACSM, 1991; the YMCA, 1989). Lack of flexibility is believed to contribute to low back pain and other related injuries. There is an overall agreement between researchers that there is no single test that can measure general flexibility, but rather flexibility is specific to the joint to be tested (ACSM 1991; Minkler & Patterson 1994). There are different types of flexibility test; some are laboratory techniques (e.g. leighton flexometer for hamstring flexibility), and some are field test (i.e. trunk flexion test).

The trunk flexion (sit-and-reach) test is a widely used test applied to measure both hamstring and low back flexibility. This test has been criticised as, first it does not take into account some anthropometric issues (i.e. limb length), which are believed to affect the validity of the test. It is argued that people with longer arms or trunk in proportion to their legs could get better results than those with shorter arms or trunk (cited in Minkler & Patterson 1994). Second, the sit and reach test has been criticised as it combines measures from two areas of flexibility (hamstring and low back flexibility).

The criterion validity of the sit-and-reach test as a measure of both hamstring and low back flexibility has been examined by correlating it to other flexibility tests (passive hamstring test; and a test of upper, lower, and total back flexibility) (Jackson & Baker 1986). The authors reported a significant correlation between the sit-and-reach test and lower back flexibility ($r = 0.28$, $P < 0.05$), and hamstring flexibility ($r = 0.64$, $P < 0.05$) in 13 to 15 year old females. Jackson and Baker concluded that the sit and reach test can be considered as a valid test for measuring hamstring flexibility, although its validity as a measure of lower back flexibility may be questionable. However, in males, the correlation between the sit and reach test and hamstring flexibility was reported to be higher ($r = 0.89$) as it was for low back flexibility $r = 0.59$ (cited in Minkler & Patterson 1994).

Nevertheless, since this test has been used for a long time and recommended by the ACSM (1991) as a general test of flexibility, it was included in this study's fitness battery. A flexibility board was made, as recommended by the YMCA, for the purpose of this test. The women were given some warm up stretching exercises to prepare them for this test. The test required the woman to reach forward from a sitting position with the legs fully extended, to the farthest point and hold this position until the measurement was made. The distance reached (the best of three trials) was recorded as a score of flexibility.

c. Muscular Endurance Measurements:

Both elbow extension and spine and hip flexion were used to measure women's muscular endurance.

1. For elbow extension measurements, the bench press test was used. From a lying position on the bench, the women were asked to press a 35 lb barbell upward with a full extension of the elbows, and then bring it back to the chest (the starting position). This procedure was repeated as many times as possible, with a rhythmic up and downward movements of 60 beats.min^{-1}, which was set by a metronome. The successful attempts were recorded.

2. The one minute timed sit-up test was used to measure the women's abdominal muscular endurance. This test is recommended by the YMCA as a test that can provide information about an individual's general muscular endurance, since abdominal muscles represent the largest group of muscles in the body. From a lying position, with the knees bent, the ankles were held by a female assistant, and the arms touching the ears, a full sit-up with the elbows alternately touching the opposite knee each time as the woman was in the up position was performed. The number of the successful sit-ups performed during the one minute were recorded.

Procedures for Measurement:

The women were required to be physically checked by their physicians prior to participation in the programme, and, each was given a letter to be signed by her physician before starting a physical training programme. Prior to the testing procedures the women and their spouses were given the women's and men's booklet of questionnaires to be filled in. Women then went through the body composition measurement procedures. Each woman was given an appointment to be tested privately. It should be noted that unlike the subjects of phase I of this study, no problematic issues relating to nudity, either from the women or from their spouses, faced the researcher, possibly because this group had shown commitment specifically to the exercise programme.

The whole testing procedure, including answering the questionnaire, measuring the body composition and exercise testing, took between 30 to 45 minutes for each woman. The test battery was conducted three times (pre-mid-post exercise programme).

EXERCISE PROGRAMME:

Guidelines and recommendations for exercise prescription are well established (American College of Sports Medicine 1978; 1991; Skinner 1987), to enhance cardio-respiratory fitness: they include frequency, duration, intensity of training, and mode of activity. As has been discussed in chapter II, a frequency of one to three times per week, and a duration of 20 to 30 minutes, gradually increasing to 40 to 60 minutes, are recommended for inactive persons to allow cardio-respiratory adaptation: an intensity of 50 to 60% Vo_2 max is recommended for sedentary people. Aerobic activities such as running, walking, bicycling, swimming, and various endurance sport activities are recommended.

It should be noted that most of these recommended guidelines were published to meet sedentary American women's needs after studying their fitness and physical status. While there had been no published study performed on the physical status and fitness condition of Bahraini women, the broad guidelines on the duration, frequency, and the mode of activities were adopted because they seemed appropriate for this group.

From the researcher's experience in this field (working with Bahraini women and sport for 10 years); the fact that these were largely sedentary women; and the hot weather in Bahrain, it was considered that the intensity of training recommended above could be too demanding for some of the women. Therefore, the intensity of training was related to women's existing fitness level after obtaining their fitness scores. The existing cardio-respiratory fitness scores in the form of a predicted Vo_2 max, were found to range between 17 and 52 $ml.kg^{-1}.min^{-1}$: therefore, the women were categorised into three groups: low, medium, and high fitness levels.

Each group was assigned an appropriate training intensity, in which distance and time served as criteria. For example, each group was instructed to walk or jog for a certain time (i.e. 10 minutes); the distance they walked or jogged during that given time was considered as the intensity of the programme. Women were asked to keep a record of their progress (the distance they walked or jogged each week), so that they became aware of what would be required for them to advance, helping them to set their own goals and progress at their own pace. As the programme proceeded, the time allocated for walking and jogging and hence the distance increased. Distance measurement was found to be more practical for the participants than heart rate monitoring, which had been found to be unreliable with this group of women, since most of them forget their heart rate counts during exercise. However, heart rate monitoring was performed during the fitness tests by using a sport tester, as mentioned earlier.

The programme established was a three month supervised aerobic exercise (walking/jogging, and exercises to enhance muscular endurance and strength, and flexibility) programme aimed to improve cardiac function and to increase their muscles' abilities to utilise oxygen through the build up of cardio-respiratory endurance. The programme was also planned to afford enjoyment and encourage an active social lifestyle for the participants. The programme included the following phases:

Phase I: warm-up:

Warm up is important as it prepares the heart and the muscles for the coming work, as well as minimising the chance of injuries. For sedentary people, this phase needs to be longer than for active people in order to accustom their hearts and muscles to the new demands. In this study, the warm up period started with 7 to 10 minutes which decreased gradually to 5 minutes as the participants became more accustomed to the programme. It included walking, static stretches to prevent injuries (no such injuries were reported), and light exercises for muscular strength and endurance preparation.

Phase II: Main Part:

This phase aimed to enhance cardio-respiratory endurance through the following exercises:

1. specific warm up for muscles involved in cardio-respiratory endurance.
2. Cardio-respiratory endurance exercises including walking at different paces, a combination of walking and jogging, and jogging.
3. Flexibility exercises.
4. Muscle tone exercise.
5. Muscular strength exercises (with occasional use of weight training).
6. Muscular endurance exercises.

The time allocated for this phase ranged between 20 to 45 minutes, in which walking and jogging exercises accounted for 10 to 30 minutes.

Phase III: Cool down:

Cool down is an essential part in the exercise programme; it helps in getting back to normal (pre-exercise condition). Cooper (1972) stated that after strenuous exercises such as running, the blood pooled in the legs; cool down exercises are intended to help in forcing blood to return back to the heart. Cool down exercises used in this research included slow walking, stretching exercises, and light exercises, in addition to the use of relaxation techniques. This phase required about 5 to 10 minutes.

Procedures of the Exercise Programme:

An official letter from the Bahrain Sports Institute was sent to the director of the sports affairs in the General Organisation For Youth and Sports, the Government body responsible for all facilities related to sports in Bahrain, asking permission to use the Bahrain National Stadium and its facilities (the human performance laboratory) for this study's exercise programme. The permission was not given immediately, since first other arrangements needed to be made: for example, several Bahraini sports association (i.e. athletics and football) had to be notified first. These associations used the stadium for

their daily training, and since their players, coaches, and managers are male, it was necessary to avoid interfering with their programme or intruding on the women's privacy. Furthermore, congruent with religious teaching, and traditional restrictions on women, the researcher emphasised the absence of males (players, administrators, guards) from the exercising site. It should be noted that these are the normal procedures adopted by the researcher in her programmes. Therefore the only time for the programme to take place in the Bahrain National Stadium was during the evening time of the summer 1993, where the maximum temperature reached 47.7 degrees Celsius during August, and the maximum relative humidity was 83% during September.

No attempt was made to change the diet of the participants, and they were encouraged to maintain their pre-exercise dietary and eating habits. However, most of them were on some kind of diet, as indicated from data obtained from the women's questionnaires. The programme was planned, organised, and carried out by the researcher with the assistance of three female coaches and one physiotherapist. Each coach was assigned one of the three groups mentioned earlier.

During the training sessions, each woman was treated individually and was given feedback on her progress. The women were informed about their weekly goals, and worked with their coaches in recording their progress towards these goals. They were informed of their weaknesses and worked with their coaches to overcome them. Cards containing each woman's body measurements were handed to the participants after every measurement. Being informed of their progress and weaknesses proved to be effective, because participants set their own goals accordingly and worked towards them. Participants were involved in decision making regarding their bodies and their fitness (e.g. about the intensity of their programme).

COMMENTARY:

The rate of adherence to the exercise programme was 100% during the first six weeks, decreasing to 68% afterwards. This could be due to the hot weather, and women's responsibilities towards their families, and possibly

also loss of interest. Such adherence rates are higher than those reported in other studies (Robertson & Mutrie 1989).

Despite the availability of different types of research instruments and methods in the literature, their applications on women, other than those studied by the authors of these instruments, may be questionable. In other words, the available instruments were developed, tested, and validated on Western women who differ from the Bahraini Muslim women in several ways, e.g. their lifestyles, religion, and tradition. The authors of these instruments had not considered the possibility that their instruments might not be appropriate for other populations. Although Western instruments were chosen for application for Bahraini women, they were only chosen after careful and extensive review of the available instruments, and they were further refined to suit the Bahraini culture. Simple and field methods such as anthropometric measurements were shown to be effective and appropriate for Bahraini women. They were simple, rapid, and used inexpensive and portable equipment: the anthropometric measurements proved to be as valid and accurate as some of the more elaborate laboratory methods.

DATA ANALYSIS:

The statistical package for social sciences (SPSS) version 6.1, was the software package used for statistical analysis. A personal notebook computer (Toshiba, T2100CS), and the computer facilities available at the computer suite at Leeds Metropolitan University were used to analyse the data. All the raw data were arranged in several data matrices (a file for each group of this study) in the SPSS programme. From the raw data, several variables were calculated:

1. From skinfold measurements, age, and body mass, the women's percentage body fat, fat mass, and fat free mass were calculated according to the equations of Durnin and Womersley (1974); and Jackson et al (1980).
2. The 40-items body cathexis scores were summed to produce an overall score of body cathexis (Secord & Jourard 1953).

3. The 25-item self-esteem scores were summed and multiplied by 4 to produce a score of the global self-esteem (Coopersmith 1991).

4. The Physical Self Perception Profile (PSPP) and the Physical Importance Profile (PIP) of the subjects were calculated in accordance to the scoring procedures provided in the author's manual (Fox 1990).

Due to the amount of raw data, an examination of any abnormal or missing data was made by using the summary programme in the SPSS (frequency tables). This programme provides the frequency, percentage, means, maximum, minimal, and normality of data distribution in terms of skewness and kurtosis values.

Statistical Procedures:

Phase I:

This phase aimed to provide information regarding Bahraini younger and older women's bodies: body image, body composition and self-esteem, and the relationships between them. The statistical techniques used were:

1. Descriptive Statistics: Measure of central tendency (the means), and the standard deviation from the means were provided for all the parametric variables. For the non-parametric variables (i.e. marital, occupational, educational status), frequency of occurrence and their percentages were used to group the data.

Parametric analysis (e.g. means, standard deviation, t-test, factor analysis, and ANOVA) were used on most of the psychological instruments, i.e. Body Cathexis Scale (Secord & Jourard 1953) and the Nine Figure Silhouette Scale (Stunkard et al 1983), following the statistical procedures used by the authors who developed them and the other researchers who used them. The points arranged at these scales - known as Likert scales - are assumed to be of equal interval, and the differences between the scale points (e.g. 1 and 2) are equal to the differences between other points (4 and 5) (Thomas & Nelson 1990). Tuker (1981; 1983a; 1985) used factor analyses on the 5 point Likert scale of the Body Cathexis Scale. Stunkard et al (1983) claimed that the nine figures silhouette are arranged in a monotonic progression according to the degree of fatness, in which number 1 silhouette is very thin, number 2 is slightly fatter, and number 9 is very fat. Therefore, applying

parametric statistics on these scales is considered to be a robust procedure (Gregoire & Driver 1987).

2. Pearson Product Moment correlation coefficient (r) was used to calculate relationships among and between measures of body image, body composition, and self-esteem of the sample groups. The significance level of r was set at $P < 0.05$, $P < 0.01$, and $P < 0.001$.

3. Student t-test was performed to compare data of the younger women to data of the older women, and for other comparisons between two means (e.g. differences between perceived figure and ideal female figure). The significance of t value was set at $P < 0.05$, $P < 0.01$, and $P < 0.001$.

4. Paired t-test was calculated to establish whether there were significant differences between women's percentage body fat calculated by Durnin and Womersley (1974) and that calculated by Jackson et al (1980).

5. Factor analysis was used on the 40-items of the Body Cathexis Scale (BCS). This technique is based on the correlation matrix of the variables to be factor analysed. Thus, before running the factor analysis procedure, it is important to examine whether the correlation matrix is appropriate for factor analysis. Bartlett's test of sphericity is often used to determine the appropriateness of the matrix. This test was performed on the 40-items of the BCS of the younger and older Bahraini women, and did not work, implying that the matrix was not appropriate. Other unsuccessful attempts were made to run the factor analysis programme. For example, since the distribution of the BSC scores were found to be negatively skewed, the scores were transformed, using the square root procedure recommended by Tabachnick and Fidell (1989), in order to establish a normally distributed scores. Thus, it was decided to treat each of the 40- body cathexis items as a single variable.

6. Analysis of Variance was applied on the silhouette choice data, measured by the Nine Figure Silhouette Scale (Stunkard et al 1983), of the

women and the male groups to calculate the differences between the groups in the way they perceived the current women (wives) figure, and the ideal female figure, and the effect of dress (nude, Western clothes, and Islamic clothes) on their choice. If the difference (F) was significant, a follow up test (post hoc analysis) was performed to identify where these significant differences located. Tukey test was used for equal sample size and Scheffe test was used for non-equal sample size (Kirk 1968). The level of significance of the two tests was set at $P < 0.05$.

Phase II:

1. This phase measured the effects of exercise programme on the body image, body composition, self-esteem, and physical fitness. The differences in the scores of these variables measured before, during, and after the exercise programme were accomplished by applying ANOVA for repeated measures. The value of significance (P) was adjusted in accordance to the sphericity of the data measured by epsilon test (Thomas & Nelson 1990). A Tukey post hoc test, with a significance level of $P < 0.05$, was performed to indicate where the significant changes took place.

2. A two way ANOVA for repeated measure was used to determine the effects of exercise on the married women's and their husbands' perceptions of the wives' current figure, and the ideal female figure, considering the effects of dress upon their perceptions. That is groups (2) by time (3) by dress (3). Tukey post hoc was calculated to indicated where the significant differences were.

3. A two way ANOVA with repeated measure was conducted to see if there were particular influences on changes with exercise, e.g. initial body fat, age, body mass. The participants were divided by age into two groups: younger than 30 years; older than 30 years. ANOVA for repeated measure was performed to calculate the interaction between age and pre, mid, post exercise programme. This procedure was repeated by manipulating different variables; however the results did not differ significantly from that of the whole group.

4. A Pearson Product Moment correlation coefficient was used to calculate the association between changes in body composition, changes in body image, changes in self-esteem, and changes in physical fitness. This analysis was performed to find out whether improvements in certain variables (e.g. body fat) were related to improvements in other variables (e.g. body cathexis).

Due to the massive number of variables in this analysis, only selected results will be presented in chapter IV.

CHAPTER IV
RESULTS

This chapter is organised into two separate sections; each to present the findings of phases I and II of the study.

PHASE I:

DESCRIPTION OF THE SAMPLE GROUPS:

This phase of the study consisted of two groups: one of younger women (20-25 years) with a mean age of 22.4 ± 1.5; and one of older women (50-55 years) with a mean age of 51.9 ± 1.8. Table 2 represents the social characteristics of the two groups. As can be seen, half of the younger group were single and half were married; the mean marriage age of the married women was 20.7 ± 1.9 years. The majority of the older women (23) were married (76.7%), while only 4 (13.3%) were single, and 3 (10%) were divorced or widowed (Table 2). The mean marriage age of this group was similar (20.6 ± 6.3 years) to that of the younger group. 8 (26.7%) of the younger women had 1 or 2 children, while 19 (63.2%) of the older group had between 2 and 6 children, and 5 (16.8%) of the older women had between 7 and 12 children.

The occupational status of the two groups are presented in Table 2, which indicates that 13 (43.3%) of the younger group were employed on a full time basis; 3 (10%) were unemployed; 6 (20%) were housewives; and 8 (26.7%) were in full time education. The majority of the older group (73.3%) were working full time and the rest 8 (26.7%) were housewives.

Ten (33.3%) of the younger women finished secondary education, and the majority 20 (66.7%) completed higher education (diploma, and bachelor degrees). The older group consisted of 4 (13.3%) without formal education; 4 (13.4%) with a primary certificate; one (3.3%) with an intermediate education; 6 (20%) with secondary education; and 15 (50%) gaining their higher education degrees (diploma, bachelor, higher diploma, and Ph.D. degrees).

The corresponding male groups (husbands) comprised 11 younger and 17 older men. The mean age of the younger husbands was 27.6 ± 3.3 years, ranging from

23 to 33 years, and that of the older husbands was 58 ± 7.1 years, ranging from 45 to 70 years.

The educational levels of the younger husbands were high; 5 (45.5%) finished secondary education, 4 (36.4%) gained higher education, and the remaining two got their intermediate level of education. The older husbands' educational levels were lower than those of the younger men, with 5 (29.4%) illiterate, 3 (17.6%) with primary education, 4 (23.5%) finishing secondary education, and 5 (29.4%) higher education.

Table 2

Characteristics of the younger and older Bahraini women

CHARACTERISTICS	YOUNGER n=30		OLDER n=30	
Age (years)	22.4 ± 1.5[a] 20-25[b]		51.9 ± 1.8[a] 50-55[b]	
Marital Status	*f*[c]	%[d]	*f*	%
single	15	50%	4	13.3%
married	15	50%	23	76.7%
separated	-	none	-	none
divorced	-	none	1	3.3%
widowed	-	none	2	6.7%
total	30	100%	30	100%
Age of marriage (years)	20.7 ± 1.9[a] 18-25[b]		20.6 ± 6.3[a] 14-36[b]	
Number of children	*f*	%	*f*	%
none	22	73.3%	6	20%
1	6	20%	-	none
2	2	6.7%	4	13.3%
3	-	none	7	23.3%
4	-	none	4	13.3%
5	-	none	3	10%
6	-	none	1	3.3%
7-12	-	none	5	16.8%
total	30	100%	30	100%
Occupational Status	*f*	%	*f*	%
working full time	13	43.3%	22	73.3%
working part time	-	none	-	none
retired	-	none	-	none
unemployed/not working	3	10%	-	none
housewife	6	20%	8	26.7%
in full time education	8	26.7%	-	none
total	30	100%	30	100%
Educational Status	*f*	%	*f*	%
illiterate	-	none	4	13.3%
primary	-	none	4	13.4%
intermediate	-	none	1	3.3%
secondary	10	33.3%	6	20%
higher education	20	66.7%	15	50%
total	30	100%	30	100%

[a] values are expressed as means and standard deviations; [b] values are expressed as ranges; [c] values are expressed as frequencies; [d] values are expressed as percentages.

Table 3 shows that 7 (23.3%) of the younger women reported that they were on weight reduction programmes, 9 (30%) were on weight maintenance programmes, and none were on weight gain programmes. The programmes they reported they were engaged in were an exercise programme, diet, and medical (drug) treatments. 4 (13.3%) of the younger women reported that they were exercising, 5 (16.7%) were dieting, four (13.3%) were combining exercise with diet, and two (6.7%) were combining exercise, diet, and drugs.

Table 3

The lifestyle of the younger and older women

	YOUNGER n = 30		OLDER n = 30	
Variables	*f*	%	*f*	%
Weight reduction	7	23.3	7	23.3
Weight maintenance	9	30	6	20
Weight gain	-	none	-	none
programme	*f*	%	*f*	%
None	15	50	18	60
Exercise	4	13.3	2	6.7
Diet	5	16.7	4	13.3
Exercise + diet	4	13.3	5	16.7
Exercise + medical treatment	-	none	-	none
diet + medical treatment	2	6.7	1	3.3
All	-	none	-	none
Total	30	100	30	100%

The lifestyle of the older women was somewhat similar to the younger group, in which Table 3 shows that 7 (23.3%) of them were trying to lose weight, 6 (20%) were in weight maintenance programmes, and none of them were trying to gain weight. Table 3 presents the sort of programme they were using to reduce or maintain their weights, in which two (6.7%) of them were exercising, 4 (13.3%) were dieting, 5 (16.7%) were using both exercise and diet methods, and one (3.3%) were using a combination.

BODY CONCERNS:

The women's concerns about their body weight and body fat are presented in Table 4: 17 (56%) of the younger women perceived themselves to be overweight, and 12 (40%) reported that they were over fat. Those women who reported that

they were overweight, indicated that their mean extra weight was 9.7 kg with a standard deviation of 6.6 kg, ranging from 2.5 to 23 kg.

These women who believed they were overweight were asked to indicate from where they got that idea: 10% of the younger women reported that they got the idea from their families; 30% indicated that they got the idea from themselves; and 16% indicated that they got this idea from other sources (i.e. friends, husbands). When asked to indicate with whom they compared themselves when they decided that they were overweight, 20% of the younger women reported that they compared themselves with other females of their age, 3.3% with female movie stars, 10% with their previous weight, and 23.3% with more than one source, (e.g. sports women; fashion models). Table 4 shows that most of the younger women were satisfied with their height 21 (70%); 5 (16.7%) of the women perceived themselves to be short; 19 (63.3%) as medium; and 6 (20%) reported that they considered themselves tall.

Table 4

Perception of current overweight/fat, and height: younger and older women

VARIABLES	YOUNGER n=30		OLDER n=30	
Perceived overweight	*f*[a]	%[b]	*f*	%
Overweight	17	56.7	19	63.3
Not overweight	13	43.3	11	36.7
Total	30	100	30	100
Perceived over fat	*f*	%	*f*	%
Over fat	12	40	12	40
Not over fat	18	60	18	60
Total	30	100	30	100
How much overweight (kg)	9.7 ± 6.6[c] 2.5-23[d]		12.7 ± 9.6[c] 3-35[d]	
Height satisfaction	*f*	%	*f*	%
Satisfied	21	70	24	80
Not satisfied	9	30	6	20
Total	30	100	30	100
Height description	*f*	%	*f*	%
Short	5	16.7	2	6.7
Medium	19	63.3	23	76.7
Tall	6	20	5	16.6
Total	30	100	30	100

[a] values are expressed in frequencies; [b] values are expressed in percentages; [c] values are expressed in means [d] values are expressed in ranges.

Table 4 also shows that 19 (63.3%) of the older women perceived themselves as overweight, and 12 (40%) as over fat. This older group thought that they were more overweight than the younger women did (mean extra weight was 12.7 ± 9.6 kg, ranging from 3 to 35 kg).

Of those who reported that they were overweight, 3.3% indicated that they got the idea from their families, 36.7% from themselves, and 23.3% from a combination of various sources (friends, husbands, etc). 40% of these women indicated that they decided that they were overweight compared with their previous weight, 16.7% compared with other females of their age, and 6.6% compared with more than one source, (e.g. sports women; movie stars; fashion models).

This group were more satisfied with their height than the younger women; 24 (80%) they were satisfied: 2 (6.7%) of the older women described themselves as short; 23 (76.7%) as medium; and 5 (16.6%) as tall.

In respect of body weight and shape, Table 5 presents younger and older women's perceptions of their actual and ideal past body weight. The table shows that 12 (40%) of the younger women, and 6 (20%) of the older women perceived themselves to be overweight in the past. The younger group mean age at that time was 18.4 ± 3.7 years, with a range of 10 to 23 years. The mean age of the older women who reported that they were overweight in the past was 25 ± 15.3 years, ranging from 1 (since they were born) to 41 years.

Table 5

Perception of past body overweight and past ideal weight (younger and older women)

VARIABLES	YOUNGER (n= 30)		OLDER (n= 30)	
Past overweight	*f*[a]	%[b]	*f*	%
Yes	12	40	6	20
No	18	60	24	80
Total	30	100	30	100
Age (years)	18.4 ± 3.7[c] 10-23[d]		25 ± 15.3 1-41	
Different past ideal weight	*f*	%	*f*	%
Yes	11	36.7	18	60
No	19	63.3	12	40
Total	30	100	30	100
Past ideal weight (kg)	53.7 ± 3.3 48-61		54.1 ± 8.0 40-72.5	
Age (years)	19.1 ± 2.1 15-22		27 ± 7.3 13-40	

[a] frequencies; [b] percentages; [c] means; [d] ranges.

The two groups of women were asked if their current ideal weight differed from their past ideal, and as shown in Table 5, 36.7% of the younger group and 60% of the older group indicated a difference. The mean past ideal weight of the younger women was 53.7 ± 3.3 kg, ranging from 48 to 61 kg, and that of the older women was 54.1 ± 8.0 kg, ranging from 40 to 72.5 kg. The younger women's mean age at the time they had different ideal female weight was 19.1 ± 2.1 years (ranging from 15 to 22 years), while it was 27 ± 7.3 years ranging from 13 to 40 years for the older women (Table 5).

Three questions were designed to explore women's perceptions of overfatness of their body parts; and if they were to change these fat parts of their bodies, to indicate from a list of reasons (see Appendix I), why they decided to change these body parts. Another question was designed to identify the body parts with which they were satisfied in terms of fatness.

With the exception of the upper abdomen (stomach), the majority of women were satisfied, in terms of fatness, with their other body parts: face; neck; chin; shoulders; upper-arm; back; waist; lower abdomen; hips; thighs; calves; and legs (overall). 40% of the younger women indicated that their upper abdomen

(stomach) was too fat and they wanted to change it for the following reasons: personal satisfaction; social desirability; to keep their husbands happy; find fitting clothes; and for better perceived health. Similarly, 40% of the older group reported that their upper abdomen (stomach) was too fat and wanted to change for better perceived health; to find fitting clothes; for personal satisfaction; social desirability; fear of chronic illness; and to achieve physical fitness.

BODY COMPOSITION:

As mentioned in chapter III, women's percentage body fat was calculated by using two different formulae (Durnin and Womersley 1974, and Jackson et al 1980). It was argued that neither of these formulae was validated on Bahraini Muslim sedentary women, and there was no available data to suggest which would be more suitable for this group of women. Therefore, the intention was first to apply these two highly recommended formulae together, and then choose one of them for this research. To decide which one was most suitable for the Bahraini sample, their correlations with each other and with other body composition measurements (e.g. skinfold thickness) were calculated by the Pearson product moment correlation coefficients. These correlations are presented in Table 6, which shows that both formulae correlated strongly with each other ($r = 0.95$, $P < 0.001$ for the younger women group; and $r = 0.89$, $P < 0.001$ for the older women group). Correlation coefficients between the two formulae and skinfold and body girth measurements were also highly significant for the younger and the older groups of women in this study (see Table 32, appendix IV), which suggests that both formulae are consistant for this study's subjects. Furthermore, a paired t-test was performed to establish whether there were significant differences between the two equations; the differences between percentage body fat calculated by the two equations were significant, with $t = 9.55$, and $P < 0.001$ for the older women; and $t = 5.11$, $P < 0.001$ for the younger women.

However, considering reliability data provided by the authors, Jackson et al (1980) warned that the reliability of their formulae could be questionable when used on women aged over 40, since their cross validation data showed that the standard error of estimation of body fat was greater in women over 40 years of age. No such qualifications on the reliability of the other formulae were given by Durnin and Womersley (1974). Therefore, since the sample group of this study ranged in age between 20 and 55 years, the researcher decided to use Durnin and Womersley's formulae.

Table 6

Correlation coefficients between percentage body fat calculated by (1) the formula of Durnin and Womersley (1974), (2) the formula of Jackson et al (1980).

	% BODY FAT 1		% BODY FAT 2	
VARIABLES	YOUNGER	OLDER	YOUNGER	OLDER
% Body fat 1	1.00	1.00	0.95***	0.89***
% Body fat 2	0.95***	0.89***	1.00	1.00

* P < 0.05; ** P < 0.01; *** P < 0.001

Table 7 shows the means and the standard deviations of the body composition of the younger and the older women. The differences in body composition values between the older and the younger women are also presented in terms of t-test results. From Table 7, it can be seen that the older women were heavier than the younger women ($P < 0.01$). The mean body mass of the older women was 69.9 kg, with a standard deviation of 13.9 kg, and that of the younger women was 61.1 kg ± 10 kg. The mean height of the older women was 155.3 cm with a standard deviation of 5.9 cm, which was slightly but not significantly shorter than that of the younger women (157.1 cm ± 5.3 cm).

Table 7

The body composition of the younger and older women

VARIABLES	YOUNGER n = 30	OLDER n = 30	t	P
Mass (kg)	61.1 ± 10	69.9 ± 13.9	2.81	0.007**
Height (cm)	157.1 ± 5.3	155.3 ± 5.9	1.24	n.s
Body Mass Index ($kg.m^{-2}$)	24.8 ± 4.2	28.9 ± 5.3	3.36	0.001**
Triceps skf (mm)	29.3 ± 9.2	36.7 ± 12.4	2.63	0.01*
Biceps skf (mm)	13.6 ± 5.7	22.4 ± 9.7	4.30	0.000***
Subscapular skf (mm)	24.4 ± 12.8	28.7 ± 10.3	1.45	n.s
Suprailiac- skf (mm)	32.3 ± 13.5	34.6 ± 13	0.66	n.s
Abdomen skf (mm)	34.8 ± 12.2	39.7 ± 11.4	1.60	n.s
Thigh skf (mm)	38.5 ± 11.1	42.6 ± 11.7	1.39	n.s
Calf skf (mm)	26.4 ± 7.6	30.4 ± 9.5	1.83	n.s
%BF	35.3 ± 5.9	44.3 ± 5.7	6.06	0.000***
Fat mass (kg)	22 ± 6.7	31.6 ± 9.2	4.58	0.000***
Fat free mass (kg)	39.1 ± 3.9	38.4 ± 5.5	0.61	n.s
Neck girth (cm)	32 ± 2	34.7 ± 2.1	4.96	0.000***
Biceps girth (cm)	29.74 ± 3.88	33.8 ± 5	3.52	0.001**
Bust girth (cm)	91.1 ± 8.7	100.6 ± 10.9	3.74	0.000***
Waist girth (cm)	73.1 ± 7.4	87.1 ± 11.2	5.73	0.000***
Abdomen girth (cm)	84.4 ± 9.3	100.7 ± 11.1	6.16	0.000***
Hips girth (cm)	97.1 ± 6.8	106.8 ± 11.7	3.93	0.000***
Thigh girth (cm)	55.9 ± 5.6	56.9 ± 6.3	0.65	n.s
Calf girth (cm)	35.5 ± 2.9	36.6 ± 4.2	1.22	n.s

* $P < 0.05$; ** $P < 0.01$; *** $P < 0.001$.

The Body Mass Index of the two groups was significantly different ($P < 0.01$), with higher values reported for the older women (mean BMI for the older was 28.9 ± 5.3 $kg.m^{-2}$, and that for the younger was 24.8 ± 4.2 $kg.m^{-2}$). The percentage body fat of the younger group (35.3 ± 5.9%) was significantly ($P < 0.001$) lower than that of the older group (44.3 ± 5.7%). The older women seemed to have more fat mass and less fat free mass (FFM) than their younger counterparts. The higher percentage body fat of the older women was attributed to the higher values of the individual skinfold measurements taken at various sites of the body, in which the triceps skinfold measurements of the older women were significantly larger than those of

the younger women ($P < 0.05$); biceps skinfold of the older was significantly larger than that of the younger women ($P < 0.001$); skinfold measurements of subscapular, suprailiac, abdomen, thigh, and calf of the older women were larger than those of the younger women, though t-test values were not statistically significant. With the exception of the thigh and calf girths, all the girth measurements (neck; biceps; bust; waist; abdomen; hips) were significantly larger in the older women than the younger women (Table 7).

BODY IMAGE:

The body image data of the younger and older groups will be presented as follows. The first set of the women's (older and younger) body image data, will be the women's attitudes towards various parts and functions of their bodies, measured by the Body Cathexis Scale. The second section will deal with the perceptual dimension of body image: perception of the real and the ideal female figure as measured by the three sets of nine female silhouettes.

- Body image 1 will represent the perception of the female nude silhouette that resembled the subjects' own figure;
- Body image 2 will represent the perception of the female Western-dressed silhouette that resembled the subjects' own figure;
- Body image 3 will represent the perception of the female Islamic-dressed silhouette that resembled the subjects' own figure,
- Ideal body image 1 will represent the ideal nude silhouette;
- Ideal body image 2 will represent the ideal Western-dressed silhouette; and
- Ideal body image 3 will represent the ideal Islamic-dressed silhouette.

Data for the total sample (30 younger and 30 older women) will be presented first, followed by data for the married women and their husbands. In addition data of another group of Bahraini males (106) will be included with the married subjects, for comparative purposes.

BODY CATHEXIS:

The older and younger women's attitudes toward their various body parts and functions are presented in Table 8; mean and standard deviations of women's body cathexis scores are listed. To compare body cathexis values reported by the younger women with those reported by the older group, a student t-test was performed (see Table 8). At first, the intention was to factor analyse the body cathexis scores of this sample to ensure that Body Cathexis Scale provided a multidimensional measure of the Bahraini women's body cathexis.

This issue of the multidimensionality of the scale was discussed earlier, in relation to the pilot study performed on a Bahraini women sample which showed that they cathected their body parts and functions in accordance with four different factors. Nevertheless, due to the small sample size of this study (30 cases in each age group), this factor analysis procedure failed, as some important criteria required to establish factor analysis (i.e. Bartlett's test of sphericity and Kaiser's measure of sampling adequacy) did not prove satisfactory. Further inspection of the normality (the values of skewness and kurtosis) of the 40 BC items showed that the majority of them were slightly negatively skewed, therefore square root transformation was performed to correct for nonnormality (Tabachnick & Fidell 1989). Factor analysis procedures were repeated after the transformation of the data and showed no improvement. Tabachnick and Fidell (1989) noted that Bartlett's test of sphericity is a sensitive test which relies on the number of cases included in the analysis, therefore the application of a less sensitive test such as Kaiser's could solve the problem. However, the two tests were applied to this sample's data by using the SPSS factor analysis programme, and failed to establish if the correlation matrix used for factor analysis was factorable. Thus, the decision was made not to use factor analysis on the body cathexis data. In any case, it is not the intention of this research to examine the issue of the multidimensionality of the Body Cathexis Scale, since previous data, either on Western or Bahraini samples, supports this assumption. This research is more concerned with studying both the general terms (body image) as well as the more specific items within each of them (e.g. attitudes towards the body in general and towards each specific part of the body).

The 40 items of the BCS are scored in accordance to a 5 point Likert scale with 1 = very dissatisfied; 2 = dissatisfied; 3 = neutral; 4 = satisfied; and 5 = very satisfied, with total BC a sum of the scores of the 40 items.

Table 8

Means, standard deviations, and t-test of the Body Cathexis scores of younger and older women

VARIABLES	YOUNGER n = 30	OLDER n = 30	t	P
AGE	4.53 ± 0.73	4.13 ± 0.78	2.06	0.04*
APPETITE	3.30 ± 1.34	3.80 ± 1.16	1.55	n.s
ARMS	3.97 ± 0.81	4.23 ± 0.68	1.38	n.s
BODY BUILD	3.37 ± 1.27	3.50 ± 1.14	0.43	n.s
BACK	3.23 ± 1.17	3.10 ± 1.03	0.47	n.s
BREASTS	3.53 ± 1.11	3.73 ± 1.11	0.70	n.s
CHEST	3.70 ± 1.15	3.93 ± 0.98	0.85	n.s
CHIN	3.93 ± 1.20	4.20 ± 0.48	1.13	n.s
CO-ORDINATION	3.50 ± 1.20	3.93 ± 0.91	1.58	n.s
DIGESTION/ELIMINATION	3.90 ± 0.80	3.90 ± 0.92	0.00	n.s
ENERGY LEVEL	3.10 ± 1.16	3.43 ± 0.97	1.21	n.s
EARS	4.30 ± 0.84	4.10 ± 0.66	1.03	n.s
EYES	4.30 ± 0.75	3.90 ± 1.06	1.69	n.s
FACIAL COMPLEXION	3.53 ± 1.14	4.13 ± 0.73	2.43	0.01*
FACE	3.83 ± 0.79	3.93 ± 0.74	0.51	n.s
FLEXIBILITY	3.33 ± 0.99	3.77 ± 0.90	1.77	n.s
HAIR DISTRIBUTION	3.13 ± 1.33	3.90 ± 0.99	2.53	0.01*
HAIR	3.30 ± 1.32	3.80 ± 1.00	1.66	n.s
HANDS	3.87 ± 0.90	3.97 ± 0.85	0.44	n.s
HEALTH	4.20 ± 0.66	3.83 ± 0.79	1.94	n.s
HEIGHT	3.50 ± 1.31	3.93 ± 1.05	1.42	n.s
HIPS	3.43 ± 1.36	3.67 ± 1.03	0.75	n.s
KEENNESS OF SENSES	4.20 ± 0.81	4.13 ± 0.63	0.36	n.s
KNEES	3.77 ± 0.97	3.13 ± 1.17	2.29	0.02*
LEGS	3.83 ± 1.21	3.77 ± 0.90	0.24	n.s
MUSCULAR STRENGTH	3.17 ± 1.10	3.43 ± 1.14	0.94	n.s
MUSCLE TONE	3.83 ± 0.79	3.43 ± 1.04	1.68	n.s
NOSE	3.80 ± 0.96	4.00 ± 0.87	0.84	n.s
OVERALL APPEARANCE	3.90 ± 0.92	4.03 ± 0.96	0.55	n.s
PHYSICAL SKILL	3.43 ± 1.01	3.63 ± 0.93	0.80	n.s
PHYSICAL STAMINA	3.30 ± 1.24	3.47 ± 1.22	0.52	n.s
PAIN TOLERANCE	3.77 ± 0.73	3.57 ± 1.01	0.88	n.s
PROFILE	3.03 ± 1.43	3.23 ± 1.19	0.59	n.s
RESISTANCE TO ILLNESS	4.07 ± 0.83	3.40 ± 1.00	2.81	0.007**
SHOULDER WIDTH	3.83 ± 0.95	4.13 ± 0.73	1.37	n.s
SLEEP	3.83 ± 0.95	3.87 ± 0.94	0.14	n.s
TEETH	3.20 ± 1.27	3.63 ± 0.96	1.49	n.s
VOICE	4.07 ± 0.98	4.03 ± 0.89	0.14	n.s
WAIST	2.93 ± 1.41	3.13 ± 1.25	0.58	n.s
WEIGHT	2.77 ± 1.52	2.93 ± 1.31	0.45	n.s
TOTAL	145.53 ± 21.19	149.80 ± 19.63	0.81	n.s

* $P < 0.05$; ** $P < 0.01$.

From Table 8, it can be seen that in general, the two groups of women appear to be either satisfied or have neutral feelings towards their body parts or functions,

with the exception of body weight which was rated with dissatisfaction from both groups of women, and the waist item, which was rated with dissatisfaction by the younger women. The older group of women seemed to be in general more satisfied with their body parts. The mean total body cathexis score of the older group was 149.80 with a standard deviation of 19.63 compared to a lower, but not significantly different, total reported by the younger group 145.53 ± 21.19

Significant differences were found between the two groups on the degree of satisfaction or dissatisfaction with five items of the Body Cathexis scale. These include attitudes towards their age, with the older group less satisfied than the younger group (mean age of the older was 4.13 ± 0.78; and mean age of the younger was 4.53 ± 0.73, $P < 0.05$). The two groups also significantly differ in their attitudes towards hair distribution on their bodies, with the older women showing more satisfaction than their younger counterparts; the mean and standard deviation of responses on hair distribution for the older women was 3.90 ± 0.99 compared to 3.13 ± 1.33 with $P < 0.05$. On the other hand, the younger group showed more satisfaction with their knees, the mean and standard deviation of the knees item 3.77 ± 0.97 compared to 3.13 ± 1.17 for the older group with t of 2.29, indicating significant differences between the two groups ($P < 0.05$). The facial complexion item showed different responses in rating between the two groups, with older women showing more satisfaction (mean 4.13 ± 0.73 compared to 3.53 ± 1.14 for the younger group ($P < 0.05$). The older group scored lower than the younger group in the resistance to illness item, with their mean score 3.40 and their standard deviation 1.00 compared to 4.07 ± 0.83 for the younger women ($P < 0.01$). These differences between the older and younger females were more about the health conscious of the older group, which might be expected. The older women showed more concern with their knees, which also could be understandable, since knee problems are associated with advancement in age. This group showed more concern about their age and about their ability to fight illness. Thus it appeared that older women's concern for their bodies seem to be more about health than appearance.

Table 9

Correlation coefficients between body cathexis and body composition variables for the younger and the older women

Body cathexis components	Body composition variables	r (younger)	r (older)
Weight	BMI	- 0.39*	- 0.37*
	weight	n.s	- 0.44*
	calf girth	n.s	- 0.41*
	hips girth	n.s	- 0.36*
	thigh girth	n.s	- 0.40*
	biceps skinfold	n.s	- 0.42*
	bust girth	- 0.40*	n.s
	subscapular skinfold	- 0.47*	n.s
	suprailiac skinfold	- 0.43*	n.s
	waist girth	- 0.37*	n.s
Height	height	0.59**	n.s
	BMI	- 0.46*	n.s
	suprailiac skinfold	- 0.48**	n.s
Waist	waist girth	- 0.37*	- 0.40*
	suprailiac skinfold	- 0.69***	n.s
	weight	- 0.59**	- 0.55**
	BMI	- 0.62***	- 0.52**
	% BF	- 0.68***	n.s
	thigh girth	- 0.55**	- 0.54**
	thigh skinfold	- 0.42*	n.s
	triceps skinfold	- 0.57**	- 0.39*
	abdomen girth	- 0.62***	- 0.54**
	abdomen skinfold	- 0.58**	- 0.43*
	bust girth	- 0.40*	- 0.40*
	hips girth	- 0.55**	- 0.49**
	biceps girth	- 0.65***	- 0.39*
	biceps skinfold	- 0.58**	n.s
	calf girth	- 0.43*	- 0.51**
	calf skinfold	n.s	- 0.42*
Hips	hips girth	- 0.58**	n.s
	weight	- 0.49**	n.s
	BMI	- 0.57**	- 0.36*
	%BF	- 0.57**	n.s
	abdomen girth	- 0.47**	- 0.44*
	abdomen skinfold	- 0.56**	n.s
	bust girth	- 0.47**	n.s
	biceps girth	- 0.52**	n.s
	biceps skinfold	- 0.60***	n.s
	calf girth	- 0.44*	n.s
	subscapular skinfold	- 0.49**	n.s
	suprailiac skinfold	- 0.67***	n.s
	thigh girth	- 0.51**	n.s
	thigh skinfold	- 0.41*	n.s
	triceps skinfold	- 0.43*	n.s
	waist girth	- 0.48**	n.s
Back	subscapular skinfold	- 0.40*	- 0.40*
	abdomen girth	n.s	- 0.47**
	bust girth	n.s	- 0.43*
	hips girth	n.s	- 0.38*
	subscapular skinfold	n.s	- 0.40*
	suprailiac skinfold	n.s	- 0.54**
	thigh girth	n.s	- 0.46*
	triceps skinfold	n.s	- 0.43*
	waist girth	n.s	- 0.48**
	%BF	n.s	- 0.47**
	BMI	n.s	- 0.37*
	weight	n.s	- 0.46*
Breasts	suprailiac skinfold	- 0.53**	n.s
	%BF	- 0.44*	n.s
	abdomen girth	- 0.39*	n.s
	abdomen skinfold	- 0.44*	n.s
	biceps skinfold	- 0.45*	n.s
Chest	suprailiac skinfold	- 0.57**	n.s
	BMI	- 0.36*	n.s
	%BF	- 0.44*	n.s
	abdomen skinfold	- 0.53**	n.s
	biceps skinfold	- 0.48**	- 0.37*
	bust girth	n.s	- 0.37*
	neck girth	n.s	- 0.40*
Arms	suprailiac skinfold	- 0.54**	n.s
	thigh girth	- 0.47**	n.s
	weight	- 0.41*	n.s
	BMI	- 0.45*	n.s
	%BF	- 0.38*	n.s
	calf girth	- 0.44*	n.s
	hips girth	- 0.40*	n.s
Legs	thigh skinfold	n.s	- 0.38*

In relation to their actual body measurements, the older and the younger women appeared to be less satisfied with their waist, weight, and back if their corresponding body measurements were large (Table 9). Negative and significant correlations were found between body cathexis variables and the measurements of these body parts (e.g. legs cathexis and thigh skinfold in the older women). Table 9 also shows that for the younger group, satisfaction with their weight, waist, breasts, chest, arms and hips was associated with smaller sizes of these and other body areas, whilst for the older group, satisfaction with their back was related to smaller sizes of most of their body measurements. Once again, there seem to be health concerns among the older women regarding their back, which they related to the fatness of their other body parts. This could be related to the lower back problems found in older ages, and possibly to more awareness of people that overweight and obesity, especially in the abdominal region can trigger low back problems.

The younger group were more satisfied with their height when they were taller. It seemed that this group's satisfaction with their bodies was higher if they were taller, thinner, and with smaller sizes in their trunk area (the correlations between weight cathexis and the measurements of waist, abdomen, and bust were negative and significant), while the older were more satisfied with their weight when they were thinner and smaller in their lower body parts measurements (Table 9).

PERCEPTIONS OF THE CURRENT AND THE IDEAL FEMALE FIGURE:

The instrument used to measure perception of current and ideal female body image was the nine female figure silhouettes developed originally by Stunkard et al (1983) and modified for this research to include nine nude female silhouettes, nine silhouettes of female figures dressed in Western clothes, and nine silhouettes dressed in Islamic clothes. From these nine nude, Western-dressed, and Islamic-dressed female silhouettes, the subjects were asked to indicate which figure was closer to their own figure, and which was considered by them to be ideal for a female. The men were asked to indicate which figure resembled their wives' figure, and which one was their ideal.

Table10

Means, standard deviations, and t-test of the Bahraini younger and older women's perceptions of their current and their ideal figures

VARIABLES	YOUNGER n = 30	OLDER n = 30	t	P
Body image 1	3.47 ± 1.07	4.10 ± 1.67	1.75	n.s
Ideal body image 1	2.73 ± 0.64	2.57 ± 0.94	0.81	n.s
Body image 2	3.30 ± 1.09	3.90 ±1.65	1.66	n.s
Ideal body image 2	2.77 ± 0.57	2.63 ± 0.81	0.74	n.s
Body image 3	3.37 ±1.03	3.83 ± 1.64	1.32	n.s
Ideal body image 3	2.67 ± 0.61	2.40 ± 0.77	1.49	n.s

Table 10 shows the means and the standard deviations of the younger and older women's perceptions of their current and ideal female figures. The differences between the perception of female figures of the two groups were calculated using a t-test and presented with their significance levels in the same table. Figure 2 depicts mean current and the ideal female figure of the younger and the older Bahraini women. It should be noted that only five of the nine female silhouette figures were shown in the figure; this is because the Bahraini women's means and standard deviations of their current and ideal female figure were located between

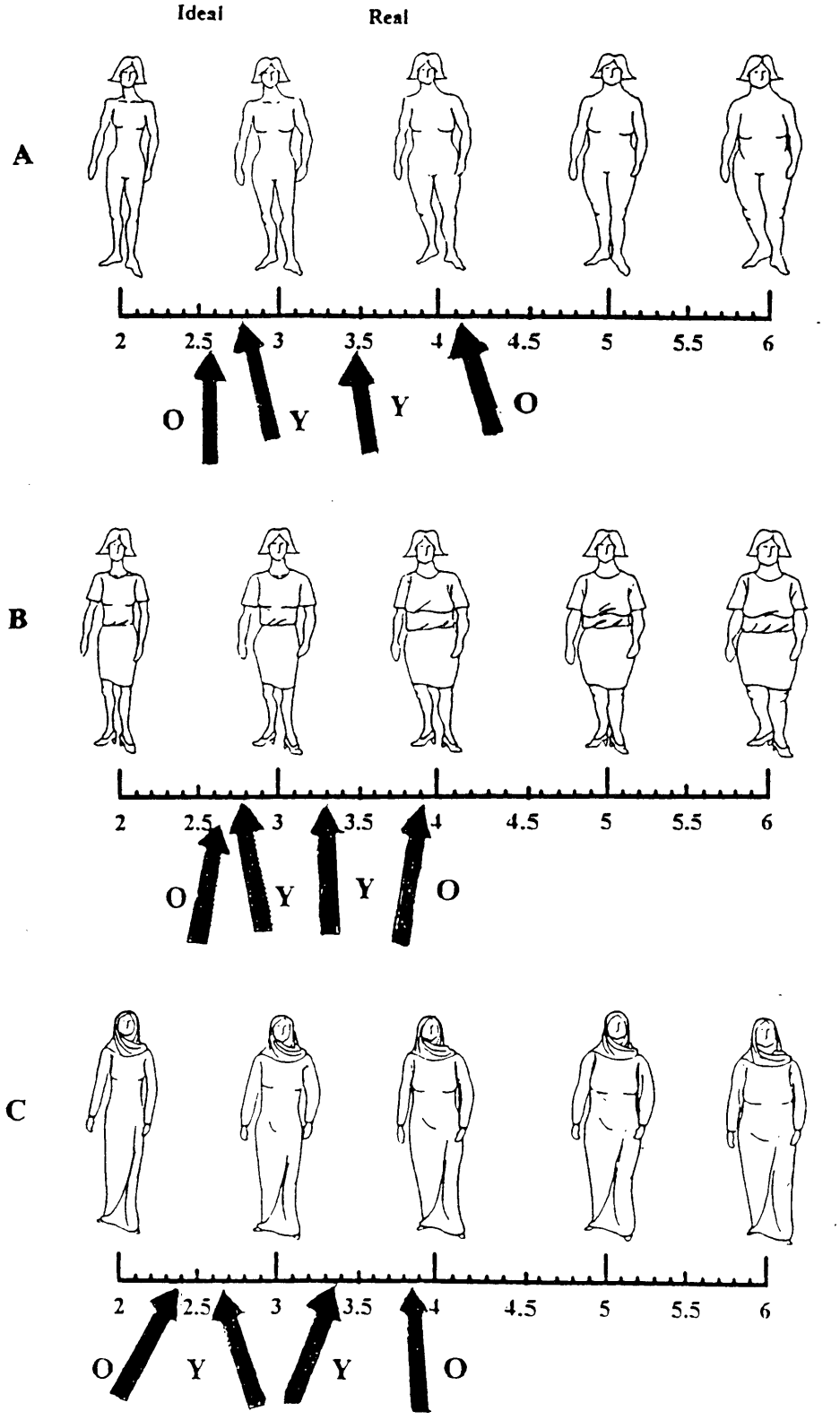


Figure 2: The older (O) and the younger (Y) women's perceptions of their (A) real and ideal nude figures, (B) real and ideal Western-dressed figures, and (C) real and ideal Islamic-dressed figures.

these five female silhouettes. It can be seen from Table 10 and figure 2, that whilst not statistically significant, the younger women perceived their bodies (nude, Western-dressed, and Islamic-dressed) to be thinner than the older women. This is in agreement with their actual body mass and fat (Table 7): the younger women were shown to be significantly lighter ($P < 0.01$) and thinner ($P < 0.001$) than the older women. The older women also perceived their body mass to be significantly heavier than the younger group ($P < 0.05$; Table 11).

With respect to the preferred ideal figure, the older women reported that they preferred a thinner female figure (nude or dressed) than their younger counterparts. Nonetheless, the differences between the two groups were not statistically significant.

Table 11

Means, standard deviations, and t-test of the younger and older women's actual, perceived, and ideal body mass

VARIABLES	YOUNGER n = 30	OLDER n = 30	t	P
Actual body mass (kg)	61.1 ± 10.0	69.9 ±13.9	2.81	0.007**
Perceived body mass (kg)	61.1 ± 9.7	67.4 ± 13.0	2.14	0.03*
Ideal body mass (kg)	54.4 ± 5.8	58.4 ± 6.4	2.51	0.01*

* $P < 0.05$, ** $P < 0.01$.

In contrast, when asked to indicate in kilogrammes what body mass was ideal, the older women idealised a heavier body mass than the younger group: mean ideal mass for the older women was 58.4 kg with a standard deviation of 6.4 kg, and that of the younger group was 54.4 ± 5.8 kg (significant at $P < 0.05$). This disagreement in the ideal body figure and ideal body mass between the two groups might suggest that these two groups of women did not relate body mass to body shape, but perceived them as different concepts.

Table 12

2x3x2 analysis of variance for group (older and younger women) x dress (nude, Western, and Islamic) x real/ideal female figures

SOURCE OF VARIATION	SS	DF	MS	F	SIG OF F
MAIN EFFECTS	100.667	4	25.167	20.380	0.00***
GROUP	3.211	1	3.211	2.600	0.108
DRESS	1.356	2	0.678	0.549	0.578
REAL/IDEAL	96.100	1	96.100	77.822	0.000***
2-WAY INTERACTION	14.067	5	2.813	2.278	0.047*
GROUP BY DRESS	0.356	2	0.178	0.144	0.866
GROUP BY REAL/IDEAL	12.844	1	12.844	10.401	0.001**
DRESS BY REAL/IDEAL	0.867	2	0.433	0.351	0.704
3-WAY INTERACTION	0.22	2	0.011	0.009	0.991
GROUP BY DRESS BY REAL/IDEAL	0.22	2	0.011	0.009	0.991
EXPLAINED	114.756	11	10.432	8.448	0.00**
RESIDUAL	429.733	348	1.235		
TOTAL	544.489	359	1.517		

* P < 0.05; ** P < 0.01; *** P < 0.001.

As might be expected, both groups of Bahraini women showed that they preferred a thinner body compared to their own; the differences between both groups' perceptions of their real and their ideal figure was statistically significant (P < 0.001; Table 12). Table 12 shows that there are significant group differences (older and younger) in the way they perceived their real figures and the ideal female figure (P < 0.01).

Table 13

Differences in the perception of the real female figure and the ideal female figure between the older and the younger women

VARIABLES	REAL	IDEAL	t	P
Body image 1[a]				
Younger (n = 30)	3.47 ± 1.07	2.73 ± 0.64	3.21	0.002**
Older (n = 30)	4.10 ± 1.67	2.57 ± 0.94	4.39	0.000***
Body image 2[b]				
Younger (n = 30)	3.30 ± 1.09	2.77 ± 0.57	2.38	0.022*
Older (n = 30)	3.90 ± 1.65	2.63 ± 0.81	3.78	0.000***
Body image 3[c]				
Younger (n =30)	3.37 ± 1.03	2.67 ± 0.61	3.20	0.002**
Older (n = 30)	3.83 ± 1.64	2.40 ± 0.77	4.33	0.000***

[a] women's perceptions of their own nude body; [b] women's perceptions of their own Western-dressed body; [c] women's perceptions of their own Islamic-dressed body.
* P < 0.05; ** P < 0.01; *** P < 0.001.

Table 13 compares the current and the ideal female figure perceived by the older and the younger women: it can be seen that the differences between the real and

the ideal female figure of the older women were greater than the differences between the values of the younger women. However, both groups significantly idealised a thinner figure than their own. Table 12 shows that dress had no effect on women's perceptions of their figures and their ideal figures: the differences in women's perceptions of their real and ideal figures, whether they were nude, or dressed in Western and Islamic, were not statistically significant.

One of the purposes of this research was to explore social influences, in terms of male attitudes, on women's bodies. The husbands of the married women were subjects as part of the study. For comparison, only data related to the married women will be presented in the following analysis.

Husbands' and their wives' perceptions of the wives' real body image and their ideal female figure are shown in Table 14 in which values are presented in terms of means and standard deviations. The table also shows the results of the t-tests to define any differences between the younger and older wives and husbands. It can be seen that, in agreement with the findings of the whole group of women, the older wives perceived their figures to be fatter, and idealised a thinner female figure than the younger wives, but the differences were not statistically significant.

Table 14

Wives' and husbands' mean real and ideal figures

VARIABLES	YOUNGER Husbands = 11 Wives = 11	OLDER Husbands = 17 Wives = 17	t	P
Wives body image 1	4.18 ± 1.17	4.76 ± 1.35	1.18	n.s
Husbands body image 1	4.27 ± 1.27	4.24 ± 1.60	0.07	n.s
Wives ideal body image 1	2.91 ± 0.54	2.53 ± 1.01	1.29	n.s
Husbands ideal body image 1	2.82 ± 0.75	2.88 ± 1.17	0.16	n.s
Wives body image 2	3.91 ± 1.22	4.47 ± 1.51	1.03	n.s
Husbands body image 2	4.45 ± 1.63	4.18 ±1.59	0.44	n.s
Wives ideal body image 2	2.82 ± 0.60	2.59 ± 0.87	0.76	n.s
Husbands ideal body image 2	2.91 ± 0.83	3.06 ±1.09	0.39	n.s
Wives body image 3	3.91 ± 1.22	4.53 ± 1.46	1.17	n.s
Husbands body image 3	4.36 ± 1.75	4.24 ± 1.56	0.20	n.s
Wives ideal body image 3	2.73 ± 0.65	2.47 ± 0.80	0.89	n.s
Husbands ideal body image 3	2.82 ± 0.87	3.12 ± 1.22	0.70	n.s

With regard to husbands' and wives' data, Table 14 shows that the older husbands perceived their wives' figures to be thinner than the wives' thought they were, and their wives body mass to be lower than that perceived by the wives themselves, which was lower than the wives' actual mass (Table 15). On the other hand, younger husbands perceived their wives' figures to be fatter than the wives perceived them to be (Table 14).

Table 15

Means, standard deviations, and t-test of married women's and their husbands' perceived body mass, and the ideal body mass

VARIABLES	YOUNGER n = 11	OLDER n = 17	t	P
Wives' actual mass (kg)	66.58 ± 10.44	74.41 ± 11.27	1.85	n.s
Wives' perceived mass (kg)	66.73 ± 10.19	72.06 ± 10.74	1.31	n.s
Wives' ideal mass (kg)	54.82 ± 7.15	59.18 ± 5.95	1.75	n.s
Husbands' perceived mass (kg)	66.86 ± 11.62	69.29 ± 12.11	0.53	n.s
Husbands' ideal mass (kg)	57.77 ± 6.16	61.91 ± 8.01	1.45	n.s

For ideal figure and ideal mass, older men reported a preference for their wives to be slightly heavier than their wives reported they wanted to be (Tables 14 and 15). The younger husbands' ideal female body was found to be, with the exception of the nude female figure, heavier than their wives preferred to be. However, these values were not significantly different (Table 14). Both wives (older and younger) and husbands (older and younger) idealised a thinner female figure than that perceived to be the wives' actual figure.

A group (younger and older wives and husbands) x dress (nude, Western, and Islamic) x real/ideal female figure ANOVA was conducted to reveal effects of dress, gender, and differences in the perceptions of the actual and ideal female figure among the husbands and wives. Post hoc Scheffe tests were conducted to find out where the differences were. The results showed that dress did not affect wives'

and husbands' perceptions of the wives' figures. Furthermore, it was found that there was no gender difference in the perception of the wives' body. However, there were significant differences between the actual and the ideal female figure perceived by both husbands and wives ($F = 117.54$ and $P < 0.001$). Also there were significant group differences (older wives; younger wives; older husbands; and younger husbands) in perceptions of the actual and the ideal wives' and female figure ($F = 2.64$, $P < 0.05$). A Scheffe test indicated significant differences between the real and the ideal female figure of the older wives' group ($P < 0.05$).

It was suggested that the male groups' opinions of their wives' bodies could be influenced by the presence of the wives, therefore to avoid biased responses from the husbands, another group of Bahraini men (not related to the female subjects) were included in this study. The group were 106 males, the majority married (76.4%). The mean age was 31.7 ± 7.5 ranging between 18 and 55 years. Most of them were highly educated: 42.5% had finished secondary school; and 46.6% had gained higher education certificates (Diploma, Bachelor, Masters, and Ph.D. degrees).

Table 16 represents the perceived and the ideal female (wives) figures selected by the 106 males. It should be noted that the single men were asked to indicate the female figure of their future wives, and their ideal female figure.

Table 16a

Males perceptions of female real and ideal figures

VARIABLES	MALES n = 106
Body image 1	3.47 ± 1.38
Body image 2	3.38 ± 1.35
Body image 3	3.38 ± 1.39
Ideal body image 1	2.93 ± 0.64
Ideal body image 2	2.88 ± 0.64
Ideal body image 3	2.84 ± 0.62

The differences between the three groups of men (young husbands, older husbands, independent sample) in the way they perceived their wives' bodies and

their ideal female figure, with the effects of dress were calculated by 3 (groups) x 2 (real/ideal female figure) x 3 (dress) ANOVA.

Table 16b

3x2x3 analysis of variance for group (younger and older husbands and the 106 males) x real/ideal female figures x dress (nude, Western, and Islamic)

SOURCE OF VARIATION	SS	DF	MS	F	SIG OF F
WITHIN AND RESIDUAL	999.14	786	1.27		
GROUP[a]	28.97	2	14.49	11.40	0.000*
REAL/IDEAL	98.71	1	98.71	77.65	0.000*
DRESS	0.09	2	0.05	0.04	0.965
GROUP BY REAL/IDEAL	22.09	2	11.04	8.69	0.000*
READ/IDEAL BY DRESS	0.06	2	0.03	0.02	0.977
GROUP BY DRESS	1.05	4	0.26	0.21	0.934
GROUP BY REAL/IDEAL BY DRESS	0.30	4	0.08	0.06	0.993
MODEL	149.08	17	8.77	6.90	0.000
TOTAL	1148.22	803	1.43		

[a] male group= 1. younger men (n = 11); 2. older men (n = 17); the other group of male (n = 106).
* P < 0.001

The results of ANOVA indicated significant main group differences ($F = 11.40$, $P < 0.001$), real/ideal differences ($F = 77.65$, $P < 0.001$), and interaction of group by real/ideal differences ($F = 8.69$, $P < 0.001$). The three groups of men (younger, older, and the 106) differed significantly in the way they perceived their wives' actual figures and the way they idealised the female figure (Scheffe; $P < 0.05$). The independent male group perceived their wives' figures to be significantly thinner than that perceived by the younger husbands (Scheffe $P < 0.05$), while unlike the younger and the older husbands, their ideal female figure was not significantly different than their wives' figures. No other differences (i.e. dress) were found between the three groups of men.

In summary, the older women tended to perceive their figures (nude, Western-dressed, and Islamic-dressed) to be heavier than their younger peers, while they idealised a thinner female figure than the younger women (not significant). The same held true for the married older and younger group of women. When reference was made to the actual body mass of the sample, the older women (the whole group) were shown to be significantly heavier than the younger group.

Considering the husbands' opinions on their wives' figures, the younger husbands tended to perceive their wives' figures as fatter than their older counterparts perceived their wives. However, the ideal female figure of the younger husbands was thinner than that of the older group of men. This indicates that among the four groups of husbands and wives, the older wives prefer a thinner female figure (nude, Western-dressed, and Islamic-dressed) than the other three groups; with the exception of the nude female figure, the older husbands showed more preference towards the fatter female figure than did the other groups.

All the female groups (married or single), and all the male groups were shown to prefer a thinner female figure than the figure perceived to be the current figure of the wives or the women.

SELF-ESTEEM:

Table 17

Global self-esteem and Physical Self Perception Profile of the younger and older women: mean; standard deviations, and t-test

VARIABLES	YOUNGER n = 30	OLDER n = 30	t	P
Global Self-esteem	62.93 ± 14.82	75.20 ± 14.46	3.25	0.002**
Sport competence	15.73 ± 4.20	14.53 ± 2.98	1.28	n.s
Physical condition	15.03 ± 3.46	14.47 ± 3.26	0.65	n.s
Body attractiveness	15.37 ± 4.09	15.87 ± 2.91	0.55	n.s
Physical strength	14.17 ± 2.88	14.73 ± 3.23	0.72	n.s
Physical self worth	15.60 ± 3.33	16.27 ± 2.45	0.88	n.s
Sport importance	5.63 ± 1.77	5.70 ± 1.26	0.17	n.s
Condition importance	5.50 ± 1.22	5.67 ± 1.37	0.50	n.s
Body importance	6.23 ± 1.43	5.83 ± 1.37	1.11	n.s
Strength importance	5.13 ± 1.28	5.83 ± 1.05	2.31	0.02*

* $P < 0.05$; ** $P < 0.01$.

Table 17 shows the means and standard deviations of the global and physical self-esteem (PSPP) values of the two groups: it also shows the t-test results conducted to examine whether any significant difference existed between the self-esteem scores of the two groups. The global self-esteem of the older group was significantly higher than the younger group ($P < 0.01$), the mean global self-esteem of the older group was 75.20 and standard deviation was 14.46, compared to 62.93 ± 14.82 for the younger group. Physical self perception of the two groups was shown to differ slightly, but not significantly. The older women rated their perception of their sport competence and their physical condition slightly lower than

the younger women. However, they rated their perception of their physical strength slightly higher than the younger women. The older women also perceived their body attractiveness to be higher than the younger women, though the differences between the two groups were not statistically significant. Overall, the older women scored higher in their perceptions of their physical worth.

When asked about the importance of these items (PSPP) to them, the older women indicated, with higher ratings than the younger group, that physical fitness items (sport, condition, and strength) are important. The younger group was shown to be more preoccupied with appearance, scoring higher than the older women in the body attractiveness importance items. However as shown in Table 17, with the exception of the global self-esteem scores and the strength importance scores, none of these differences between the two groups was statistically significant.

Nonetheless, it appears that the older women think of themselves more positively and showed more appreciation of their bodies than the younger group did, while the younger women perceived their sport competence and their physical condition higher than the older women.

Relationships between body image, body composition, and self-esteem of the younger women group:

Table 18 presents a correlation matrix including body image, body composition, and self-esteem variables of the younger women. Body image variables listed in the table are: total body cathexis; body image 1 (nude female silhouettes); body image 2 (Western-dressed female silhouettes); body image 3 (Islamic-dressed silhouettes); ideal body image 1; ideal body image 2; ideal body image 3; ideal mass; and perceived mass. Body composition variables are: body mass; body height; percentage body fat; fat mass; fat free mass; and Body Mass Index. Self-esteem variables are: global self-esteem; and Physical Self Perception sub-scales including sport competence; physical condition; body attractiveness; physical strength; and physical self worth.

Table 18

Correlation coefficients between body image, body composition, and self-esteem variables of the younger women

VARIABLES	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
1. Mass (kg)	1.00																				
2. Height (cm)	0.20	1.00																			
3. % Body fat	0.85***	0.01	1.00																		
4. Fat mass (kg)	0.96***	0.08	0.95***	1.00																	
5. FFM (kg)	0.89***	0.39*	0.53**	0.74***	1.00																
6. BMII ($kg.m^{-2}$)	0.91***	-0.22	0.84***	0.92***	0.72***	1.00															
7. Global Self-esteem	0.15	0.14	0.26	0.21	0.01	0.09	1.00														
8. Sport	0.18	0.52**	0.03	0.11	0.26	-0.06	0.14	1.00													
9. Condition	- 0.15	0.52**	-0.24	-0.23	0.01	- 0.38*	0.23	0.68***	1.00												
10. Body	-0.20	0.36*	-0.24	-0.26	-0.06	-0.34	0.14	-0.01	0.38*	1.00											
11. Strength	0.47**	0.23	0.42*	0.44*	0.45*	0.39*	0.10	0.40*	0.26	0.09	1.00										
12. Physical self worth	- 0.37*	0.38*	-0.35	- 0.40*	-0.26	- 0.53**	0.38*	0.31	0.73***	0.45*	0.10	1.00									
13. Body cathexis	-0.26	0.19	- 0.39*	-0.35	-0.07	-0.33	0.30	0.17	0.60***	0.42*	0.23	0.67***	1.00								
14. Body image 1	0.73***	-0.19	0.74***	0.78***	0.53**	0.81***	0.14	-0.03	-0.34	- 0.49**	0.26	- 0.37*	-0.32	1.00							
15. Body image 2	0.76***	-0.11	0.70***	0.77***	0.62***	0.81***	-0.08	0.02	-0.31	- 0.41*	0.29	- 0.40*	- 0.38*	0.91***	1.00						
16. Body image 3	0.77***	-0.19	0.76***	0.80***	0.59**	0.86***	-0.01	-0.02	-0.36	- 0.47**	0.34	- 0.44*	-0.35	0.90***	0.94***	1.00					
17. Ideal body image 1	-0.10	-0.12	-0.16	-0.09	-0.08	-0.06	0.13	-0.02	0.03	-0.10	- 0.39*	0.21	0.10	0.29	0.22	0.15	1.00				
18. Ideal body image 2	0.05	0.12	-0.14	-0.03	0.16	-0.01	-0.05	0.17	0.20	0.25	-0.10	0.31	0.12	0.18	0.28	0.15	0.77***	1.00			
19. Ideal body image 3	0.01	0.05	-0.15	-0.05	0.12	- 0.00	-0.13	0.03	0.07	0.02	-0.22	0.17	0.05	0.19	0.31	0.26	0.83***	0.87***	1.00		
20. Perceived mass (kg)	0.98***	0.19	0.85***	0.96***	0.86***	0.90***	0.13	0.15	-0.19	-0.21	0.45*	- 0.42*	-0.31	0.74***	0.76***	0.76***	-0.10	0.00	-0.01	1.00	
21. Ideal mass (kg)	0.41*	0.72***	0.19	0.28	0.56**	0.08	0.21	0.43*	0.49**	0.36*	0.24	0.19	0.22	-0.05	-0.02	0.00	-0.04	0.17	0.10	0.39*	1.00

* P < 0.05; ** P < 0.01; *** P

1. Correlation among body image variables (Table 18):

The women's total body cathexis scores were found to correlate negatively with their perceptions of their current figures (nude; Western-dressed; and Islamic-dressed), significant only with perception of the western-dressed figure ($r = -0.38$, $P < 0.05$). The correlation coefficients between women's body cathexis and their ideal body image (nude, Western-dressed, and Islamic-dressed) were weak and not significant. Body cathexis and perceived body mass were found to correlate negatively, but not significantly, ($r = -0.31$, $P > 0.05$), meaning that as women perceived their mass to be low, they tended to have positive attitudes towards their body parts and functions.

Perception of the current figure (nude, Western-dressed, and Islamic-dressed) was found to correlate highly and significantly with each other (r ranged from 0.90 to 0.94, $P < 0.001$). Perceptions of female ideal figure (nude, Western-dressed, and Islamic-dressed) were found to correlate highly with each other with r ranging from 0.77 to 0.87, $P < 0.001$. No significant correlation was found between perceptions of the current female figure (chosen from nude, Western-dressed, and Islamic-dressed female silhouettes) and perceptions of the ideal female figure from the same line up of silhouettes.

Perceived body mass was found to correlate positively and highly significantly ($P < 0.001$) with their perceptions of their current nude ($r = 0.74$), Western-dressed ($r = 0.76$), and Islamic dressed figure ($r = 0.76$). This implies that the women who perceived their body mass to be heavy also perceived their figures to be fat, which could indicate realism in their perceptions.

2. Correlation among body composition variables (Table 18):

Women's body mass, percentage body fat, fat mass, fat free mass, and BMI were found to correlate positively and significantly with each other, with r ranging from 0.53, $P < 0.01$ to $r = 0.96$, $P < 0.001$. Height was found to correlate moderately, but was statistically significant, with fat free mass ($r = 0.39$, $P < 0.05$).

3. Correlation among self-esteem variables (Table 18):

Global self-esteem was found to correlate moderately and significantly only with the physical self worth domain of the Physical Self Perception Profile (PSPP) ($r = 0.38$ and $P < 0.05$). Women's physical self worth correlated significantly with the physical condition sub-domain of the PSPP ($r = 0.73$, $P < 0.001$), and with the body attractiveness sub-domain of the PSPP ($r = 0.45$, $P < 0.05$). The correlation between physical self worth and the sport competence sub-domain was positive and moderate, though not statistically significant. Correlation coefficients among the four sub-domains of the PSPP (sport, condition, body, and strength) were significant ($r = 0.68$, $P < 0.001$) between sport and condition; ($r = 0.38$, $P < 0.05$) between body and condition; and ($r = 0.40$, $P < 0.05$) between sport and strength.

4. Correlations between body composition and self-esteem (Table 18):

Although there was no significant correlation between the women's global self-esteem and their body composition variables, their Physical Self Perception Profile was found to correlate significantly with some of body composition variables. Significant and positive correlations were found between body height and the following sub-domains of the PSPP: sport competence ($r = 0.52$, $P < 0.01$); physical condition ($r = 0.52$, $P < 0.01$); body attractiveness ($r = 0.36$, $P < 0.05$); and physical self worth ($r = 0.38$, $P < 0.05$). This suggests that this group of women related tallness with body

attractiveness and better physical fitness status, and hence positive feelings about the self.

Physical strength, on the other hand was found to correlate moderately but positively and significantly with body mass, percentage body fat, fat mass, fat free mass (FFM), and BMI (r ranged between 0.39 and 0.47, $P < 0.05$). The fatter and the heavier the women were, the more they perceived their physical strength. The physical self worth (PSW) domain of the PSPP was found to correlate negatively and significantly with body mass ($r = - 0.37$, $P < 0.05$), fat mass ($r = - 0.40$, $P < 0.05$), and BMI ($r = - 0.53$, $P < 0.01$). It appeared that the women perceived their physical self worth lower when they were heavier and fatter.

5. Correlations between body composition and body image (Table 18):

Women's perceptions of their own figure (from the female silhouette sets), nude or dressed, correlated positively and significantly with their actual body mass, percentage body fat, fat mass, FFM, and BMI (r ranged from 0.53, $P < 0.01$; to 0.86, $P < 0.001$). Table 18 shows that perceived body mass was found to correlate positively and significantly with all body composition variables (r ranged from 0.85 to 0.98, $P < 0.001$), except height. Ideal body mass correlated moderately with actual body mass ($r = 0.41$, $P < 0.05$), FFM ($r = 0.56$, $P < 0.01$), and highly with height ($r = 0.72$, $P < 0.001$). It appeared that those women who were taller and whose body mass was heavier, were likely to idealise a heavier mass for their ideal bodies. Percentage body fat was found to be moderately and negatively correlated with total body cathexis ($r = -0.39$, $P < 0.05$), meaning that the lower the body fat, the more women were satisfied with their body parts and functions.

6. Correlation between body image and self-esteem (Table 18):

Women's degrees of satisfaction or dissatisfactions with their body parts and functions (body cathexis) were found to correlate moderately, although not statistically significantly, with their global self-esteem ($r = 0.30$, $P > 0.05$). This positive correlation could indicate that when women cathected their body parts positively, they tended to have higher self-esteem. Body cathexis was found to correlate significantly with the PSPP domain (physical self worth) ($r = 0.67$, $P < 0.001$), and the PSPP sub-domains - physical condition ($r = 0.60$, $P < 0.001$), and body attractiveness ($r = 0.42$, $P < 0.05$). Positive attitudes towards the body seem to be associated, for this group of women, with a higher perception of their physical condition, which in turn is connected with perceiving the self positively. It also appeared that positive attitudes towards these women's bodies were associated with perception of the attractiveness of their bodies.

There were significant negative correlations between physical self worth and women's perception of their current nude, Western-dressed, and Islamic-dressed figure (r ranged from - 0.37 to - 0.44, $P < 0.05$). This shows that the thinner the women perceived their bodies to be, the more highly they valued themselves and the more highly they perceived their body attractiveness. Similarly, a negative significant correlation was found between physical self worth and perceived mass ($r = -0.42$, $P < 0.05$).

A summary of this correlational data implies that the heavier and the fatter the younger women were, the lower their physical self worth was and the more they were dissatisfied with their body parts and functions. Moreover, the higher they perceived their physical worth, the higher their self-esteem was. The fatter the women perceived their bodies were, the less physically attractive they felt.

Relationships between body image, body composition and self-esteem of the older women:

Table 19 presents correlation coefficients with the significance level (P value) between body image variables, body composition variables, and self-esteem variables of the older Bahraini women.

1. Correlation among body image variables (Table 19):

Older women's body cathexis correlated moderately and negatively with their perceptions of their Western-dressed current figure ($r = -0.37$, $P < 0.05$), and with perceived body mass ($r = -0.48$, $P < 0.01$). Perception of their current figures (nude, Western-dressed, and Islamic-dressed) correlated highly and significantly with each other (r ranged from 0.93 to 0.96, $P < 0.001$). Similarly, their perception of their ideal figures (nude, Western-dressed, and Islamic-dressed) correlated highly, positively and significantly with each other (r ranged from 0.78 to 0.88, $P < 0.001$).

Women's perceived body mass correlated significantly with their perceptions of their current nude, Western-dressed, and Islamic-dressed figure (r ranged from 0.74 to 0.76, $P < 0.001$).

Table 19
Correlation coefficients between body image, body composition, and self-esteem variables of the older women

variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
1. Mass (kg)	1.00																				
2. Height (cm)	0.40*	1.00																			
3. % Body fat	0.75***	0.14	1.00																		
4.Fat mass (kg)	0.97***	0.32	0.88***	1.00																	
5. FFM (kg)	0.91***	0.48**	0.45*	0.78***	1.00																
6. BMII ($kg.m^{-2}$)	0.92***	0.02	0.78***	0.92***	0.79***	1.00															
7. Global Self-esteem	0.31	-0.02	0.04	0.23	0.41*	0.34	1.00														
8. Sport	-0.18	-0.01	0.09	-0.12	-0.26	-0.18	-0.32	1.00													
9. Condition	-0.32	-0.01	-0.17	-0.33	-0.26	-0.34	-0.04	0.59**	1.00												
10. Body	-0.51**	-0.11	-0.38*	-0.53**	-0.42*	-0.51**	-0.29	0.36*	0.59**	1.00											
11. Strength	-0.13	0.14	0.01	-0.11	-0.14	-0.19	0.14	0.07	0.27	0.07	1.00										
12. Physical self worth	-0.20	-0.09	-0.07	-0.19	-0.18	-0.18	0.10	0.19	0.65***	0.63***	0.33	1.00									
13. Body cathexis	-0.45*	-0.25	-0.26	-0.42*	-0.42*	-0.39*	0.31	0.14	0.44*	0.37*	0.45*	0.57**	1.00								
14. Body image 1	0.66***	-0.10	0.59**	0.67***	0.55**	0.77***	0.16	-0.24	-0.45*	-0.54**	-0.14	-0.35	-0.31	1.00							
15. Body image 2	0.63***	-0.09	0.61***	0.66***	0.49**	0.74***	0.13	-0.30	-0.52**	-0.56**	-0.04	-0.38*	-0.37*	0.93***	1.00						
16. Body image 3	0.63***	-0.14	0.65***	0.67***	0.47**	0.75***	0.15	-0.31	-0.45*	-0.55**	-0.11	-0.32	-0.32	0.93***	0.96***	1.00					
17. Ideal body image 1	-0.11	-0.38*	-0.09	-0.09	-0.13	0.04	0.13	-0.26	-0.35	-0.30	-0.12	-0.22	0.03	0.21	0.24	0.24	1.00				
18. Ideal body image 2	-0.03	-0.26	0.10	0.03	-0.13	0.09	-0.10	-0.23	-0.44*	-0.34	-0.07	-0.26	-0.06	0.31	0.39*	0.37*	0.88***	1.00			
19. Ideal body image 3	-0.02	-0.28	0.10	0.02	-0.07	0.11	0.04	-0.10	-0.19	-0.33	0.10	-0.17	0.00	0.26	0.33	0.35	0.78***	0.80***	1.00		
20. Perceived mass (kg)	0.95***	0.32	0.74***	0.94***	0.84***	0.91***	0.28	-0.27	-0.42*	-0.55**	-0.11	-0.26	-0.48**	0.74***	0.76***	0.75***	-0.08	0.04	0.01	1.00	
21. Ideal mass (kg)	0.56**	0.70***	0.28	0.49**	0.61***	0.32	0.02	0.01	0.01	-0.12	0.01	-0.02	-0.26	0.12	0.07	0.06	-0.02	0.01	0.07	0.45*	1.00

*P<0.05;**P<0.01;***P<0.001.

2. Correlation among body composition variables (Table 19):

Body mass was found to correlate moderately but significantly with body height ($r = 0.40$, $P < 0.05$), and highly with percentage body fat ($r = 0.75$, $P < 0.001$), fat mass ($r = 0.97$, $P < 0.001$), FFM ($r = 0.91$, $P < 0.001$), and BMI ($r = 0.92$, $P < 0.001$). On the other hand, body height was found to correlate, in addition to body mass, only with FFM ($r = 0.48$, $P < 0.01$). Percentage body fat correlated highly and significantly with fat mass ($r = 0.88$, $P < 0.001$) and BMI ($r = 78$, $P < 0.001$); and moderately with FFM ($r = 0.45$, $P < 0.05$). The correlation between fat mass and FFM was positively high with ($r = 0.78$, $P < 0.001$, and between fat mass and BMI was also high ($r = 0.92$, $P < 0.001$). BMI and FFM correlated highly with each other ($r = 0.79$, $P < 0.001$). In summary, all the body composition variables, except height, correlated significantly and positively with each other.

3. Correlation among self-esteem variables (Table 19):

No significant correlation were found between the older women's global self-esteem and their scores in any of the domains and sub-domains of the PSPP (sport, condition, body, strength, and physical self worth). Correlation coefficients among the PSPP's scales were as follows: physical self worth correlated positively and significantly with physical condition ($r = 0.65$, $P < 0.001$), and body attractiveness ($r = 0.63$, $P < 0.001$). There was a moderate and positive, but not significant, correlation between physical self worth and physical strength. It appeared that women's positive feelings about themselves were associated with high perceptions of their physical fitness items (condition and strength), and with their high perceptions of their physical attractiveness. Sport competence was found to be moderately correlated with physical condition ($r = 0.59$, $P < 0.01$), and body attractiveness ($r = 0.36$, $P < 0.05$). Physical condition and body attractiveness were moderately correlated ($r = 0.59$, $P < 0.01$).

4. Correlation coefficients between body composition and self-esteem (Table 19):

The body attractiveness subdomain of the PSPP was found to be negatively and significantly correlated with body mass ($r = - 0.51$, $P < 0.01$); percentage body fat ($r = - 0.38$, $P < 0.05$); fat mass ($r = - 0.53$, $P < 0.05$); FFM ($r = - 0.42$, $P < 0.05$); and

BMI ($r = -0.51$, $P < 0.01$). Global self-esteem was found to be positively correlated with FFM ($r = 0.41$, $P < 0.05$). FFM is body mass minus fat mass, or the non-fat tissues (i.e. muscles). In this sense, women felt better about themselves when their FFM was greater, in which their bodies contained more muscle tissues than fat tissues.

5. Correlation coefficients between body composition and body image (Table 19):
Total body cathexis was found to be moderately and negatively correlated with body mass, fat mass, FFM, and BMI, (r ranged from - 0.39 to - 0.45, $P < 0.05$ for all of them). Women's perceptions of their current figure (nude, Western-dressed, and Islamic-dressed) correlated positively and significantly with their body mass (r ranged from 0.63 to 0.66, $P < 0.001$), percentage body fat (r ranged from 0.59, $P <$ 0.01to 0.65, $P < 0.001$), fat mass (r ranged from 0.66 to 0.67, $P < 0.001$), FFM (r ranged from 0.47 to 0.55, $P < 0.01$), and BMI (r ranged from 0.74 to 0.77, $P <$ 0.001). Perceived mass was found to correlate highly and significantly with the all the body composition variables, except height, (r ranged from 0.74 to 0.95, $P <$ 0.001). Older women's ideal body mass correlated significantly with body mass ($r = 0.56$, $P < 0.01$); height ($r = 0.70$, $P < 0.001$); fat mass ($r = 0.49$, $P < 0.01$); and FFM ($r = 0.61$, $P < 0.001$).

6. Correlation coefficients between self-esteem and body image (Table 19):
Global self-esteem did not correlate significantly with any of the body image variables, although it correlated moderately, but not significantly, and in the expected direction (positive) with total body cathexis with $r = 0.31$.

Total body cathexis was found to correlate positively and significantly ($P < 0.05$) with three of the PSPP subdomains; physical condition ($r = 0.44$), body attractiveness ($r = 0.37$), physical strength ($r = 0.45$), and with physical self worth domain ($r = 0.57$, $P < 0.01$). These correlations may suggest that women held positive attitudes towards their body parts and functions when they perceived their physical fitness status (condition and strength) to be high, and as they felt physically attractive.

Women's perceptions of their current figures (nude, Western-dressed, and Islamic-dressed) correlated negatively and significantly with their physical condition (r ranged from - 0.45 to - 0.52, $P < 0.05$), and with body attractiveness (r ranged from - 0.54 to - 0.56, $P < 0.01$). Women's perceptions of their Western-dressed current figures correlated negatively and significantly with physical self worth ($r = -0.38$, $P < 0.05$). Women's perceived body mass correlated negatively and significantly with their physical condition sub-domain of the PSPP ($r = -0.42$, $P < 0.05$), and body attractiveness sub-domain of the PSPP ($r = -0.55$, $P < 0.01$).

It appears from the findings reported in this section that physical condition was a very important factor in which the higher the women perceived their physical condition, the better they cathected their body parts and functions, the more positive they felt about their body attractiveness and their physical self worth, the thinner they perceived their figures (nude, Western and Islamic-dressed) and the lighter they perceived their mass.

In summary, the older women thought more positively about their body attractiveness and felt more satisfied with their body parts and functions when they were actually thinner and lighter, and when they perceived their bodies to be thin.

PHASE II

The 12 week exercise programme was conducted to explore the effects of exercise on women's body image, body composition, self-esteem, and physical fitness. Changes in these factors with time (pre, mid, and post the exercise programme) were used to determine the effects of exercise. ANOVA for repeated measures was used to examine the differences between pre, mid, and post exercise values. The Tukey test was used for post hoc comparisons to determine at what stage changes took place (e.g. between pre and mid exercise; pre and post exercise; or mid and post exercise).

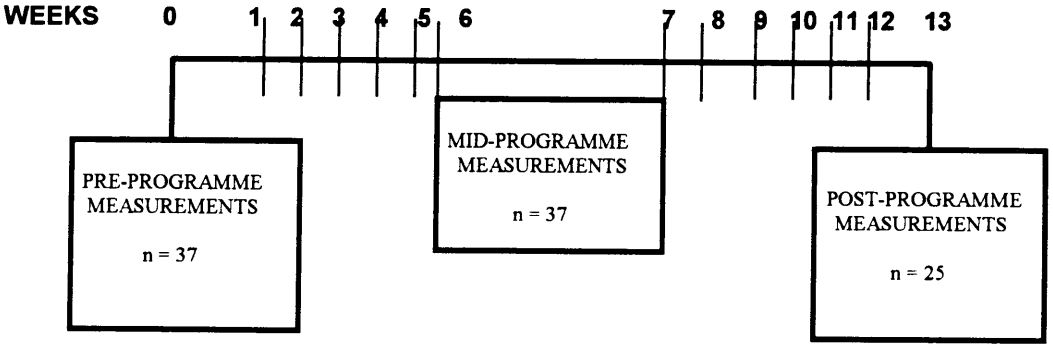


Figure 3: The exercise programme testing and training timetable

Figure 3 illustrates the plan of the exercise programme testing procedures conducted in this phase. The programme started with 37 women and ended with 25 of them giving an unequal sample size in each measurement time. Thus, to facilitate the statistical analysis (i.e. to avoid dealing with estimating means for missing data), it was decided to use only the data of those 25 women who completed the 12 week programme. However, differences between the data for the 25 women and those of the 12 who dropped out were calculated using a t-test and this indicated that no significant differences were found between the two groups in any physiological, sociological, most of the psychological, and demographic variables.

ANOVA for repeated measures requires several assumptions to be met in order to provide robust data for further interpretation. These are homogeneity; equality of variances among all the variables; and sphericity. These assumptions are strict and may not always be met in repeated measures. According to Thomas and Nelson (1990), the assumption of sphericity of data is the most important one for this kind of measurement. To estimate the sphericity of the data, a test (epsilon) is recommended (Thomas & Nelson 1990). An epsilon value ranging between 0.75 and 1.00 is required for repeated measures, and any values lower than that range would affect (inflate) the magnitude of P value of significance. For low epsilon values, a further test is recommended to correct the strength of P.

A test of sphericity was performed on this study's data through these ANOVA for repeated measures programme, using the SPSS statistical package, and adjustment for the values of P was performed on all the variables. The values of adjusted P are presented in the following tables.

DESCRIPTION OF THE SAMPLE GROUP:

The 25 women who completed the exercise programme represent 68% of the sample group of 37 who started the programme. Most of the twelve who dropped out were single (9) and either working full time (6) or students (3). It could be suggested that these women dropped out because of their obligations to their work and studies.

Table 20 shows a description of the sample group characteristics presented as means, standard deviations, frequencies, and percentages. The sample group consisted of 25 women whose mean age was 31.1 years with a standard deviation of 6.7 years (ranging between 20 to 42 years). The majority were married (80%),with a marriage age of 22.1 ± 4.3 years. 9 (36%) of the women did not have children, while 16 (64%) had between one and six children.

The table shows that 14 (56%) of the women were employed on a full time basis; 8 (32%) were housewives; 2 (8%) were full time students; and 1 (4%) was not working. This group of women showed that they adhered to the programme, even

though they were working, mothers and wives. The educational status of the women was high, with the majority (12) of them having completed their secondary level of education; 11 (44%) gained a higher degree of education (Diploma, Bachelor, and Masters), and only 2 (8%) women had not entered their secondary level of education.

Table 20

Characteristics of the exercising group

CHARACTERISTICS	VALUES n=25	
Age (years)	31.1[a] ± 6.7 20-42[b]	
Marital status	*f*[c]	%[d]
Single	5	20%
Married	20	80%
Separated	0	none
Divorced	0	none
Widowed	0	none
Total	25	100%
Age of marriage (years)	22.1[a] ± 4.3 17-36[b]	
Number of children	*f*	%
none	9	36%
1	1	4%
2	4	16%
3	4	16%
4	2	8%
5	3	12%
6	2	8%
total	25	100%
Occupational status	*f*	%
Working full time	14	56%
Working part time	0	none
Retired	0	none
Unemployed/not working	1	4%
Housewife	8	32%
In full time education	2	8%
Total	25	100%
Educational status	*f*	%
Illiterate	0	none
Primary	0	none
Intermediate	2	8%
Secondary	12	48%
Higher education	11	44%
Total	25	100%

[a] values are expressed in means and standard deviations; [b] values are expressed in ranges; [c] values are expressed in frequencies; [d] values are expressed in percentage.

The corresponding male group of 19 spouses were aged between 27 and 47 years, with a mean age of 37.1 ± 5.8 years. The majority of them finished their

secondary level of education (52.6%), 42.1% gained higher education degrees (Diploma, Bachelor, and Masters), and 26.3% of them did not continue their education. All were working on a full time basis.

Table 21

The lifestyles of the exercising women (pre-mid-post exercise)

	PRE n=25		MID n=25		POST n=25	
	f	%	*f*	%	*f*	%
Weight reduction	10	40%	18	72%	18	72%
Weight maintenance	5	20%	6	24%	6	24%
Weight gain	0	none	0	none	0	none
Programmes						
None	10	40%	1	4%	0	none
Exercise	6	24%	3	12%	6	24%
Diet	2	8%	0	none	1	4%
Exercise + diet	7	28%	19	76%	18	72%
Exercise + medical treatment	0	none	0	none	0	none
Diet + medical treatment	0	none	0	none	0	none
All	0	none	2	8%	0	none
Total	25	100%	25	100%	25	100%

Table 21 lists aspects of the lifestyles of the exercising women prior to joining the exercise programme. 10 (40%) of them were trying to lose weight and 5 (20%) were in weight maintenance programmes, while none of them was attempting to gain weight. The same table shows that 6 (24%) of those who reported that they were trying to lose or maintain their weight were doing some sort of exercise; 2 (8%) were on a diet; and 7 (28%) were combining exercise and dieting.

As mentioned in the previous chapter, no attempt was made to change the participants' lifestyles, although some of the women were, during the programme of this study, dieting and using other methods to reduce their weight. Table 21 also shows the lifestyle factors of the women during and at the end of the programme, in which the number of those who reported that they were trying to lose weight increased 18 (72%), and also more women reported that in the mid exercise measurement, they were maintaining their weight 6 (24%). Among those who were reducing or maintaining their weight 3 (12%) reported that they were using exercise as a method; 19 (76%) reported that they were combining diet with exercise; and 2 (8%) were using, in addition to exercise and diet, medical treatment (drugs) to

reduce their weight. By the end of the programme still some women reported that they were on some sort of weight reduction programmes 18 (72%); and another 6 (24%) were on weight maintenance programmes. Those programmes were exercise, 6 (24%) of the women were exercising; 1 (4%) was dieting; and 18 (72%) were on combinations of exercise and diet.

BODY CONCERNS:

The data regarding the women's concerns about their body weight, height, and fat are presented in Table 22, recorded as means, standard deviations, frequencies, and percentages.

Table 22

Perceptions of current overweight/fat, and height: exercising women

	PRE n=25		MID n=25		POST n=25	
Perceived overweight	*f*[a]	%[b]	*f*	%	*f*	%
Overweight	23	92%	23	92%	23	92%
Not overweight	2	8%	2	8%	2	8%
Total	25	100%	25	100%	25	100%
Perceived over fat	*f*	%	*f*	%	*f*	%
Over fat	19	76%	18	72%	17	68%
Not over fat	6	24%	7	28%	8	32%
Total	25	100%	25	100%	25	100%
How much overweight (kg)	15.9* ± 8 2-30**		15.1* ± 10 2-40**		14.7* ± 10 2-36**	
Height satisfaction	*f*	%	*f*	%	*f*	%
Satisfied	22	88%	20	80%	21	84%
Not satisfied	3	12%	5	20%	4	16%
Total	25	100%	25	100%	25	100%
Height description	*f*	%	*f*	%	*f*	%
Short	2	8%	2	8%	3	12%
Medium	16	64%	18	72%	15	60%
Tall	7	28%	5	20%	7	28%
Total	25	100%	25	100%	25	100%

[a] frequencies; [b] percentages; * means and standard deviations; ** ranges.

Table 22 indicates that prior to the exercise programme, 23 (92%) of the women considered themselves overweight, and this did not change during the programme. On the other hand, at the pre exercise measurement 19 (76%) of the group perceived themselves to be over fat; at the mid exercise measurement, 18 (72%)

reported that they were overfat; and by the end of the programme, this number and percentage had reduced to 17 (68%).

The women reported that their pre programme mean extra weight was 15.9 ± 8 kg, which reduced to 15.1 ± 10 kg by the mid programme and to 14.7 ± 10 kg for the post exercise programme measurement.

92% of the women who reported that they were overweight were asked to indicate the sources of this perception: one (4%) indicated that she got the idea from her family; one (4%) indicated that her husband influenced her; 10 (40%) indicated that it was their own perception; 2 (8%) had been influenced by their friends; and the remaining 9 (36%) indicated that their sources were combinations of the above. The same group of women were then asked to indicate with whom they compared themselves when they decided that they were overweight. Two (8%) indicated that they compared themselves with other females of their ages; one (4%) with movie stars; two (8%) with sports women; 5 (20%) with their previous weight; and the remaining 13 (52%) with more than one of these. The majority of the women were highly satisfied with their height for the three measurement times (Table 22). The table shows that in the pre exercise measurement, two (8%) of the women described themselves as short, 16 (64%) as medium, and 7 (28%) as tall: the mid exercise measurement descriptions were slightly different with two (8%) short, 18 (72%) medium, and 5 (20%) tall. By the end of the programme 3 (12%) of the women described themselves as short, 15 (60%) medium, and 7 (28%) tall.

Table 23

Perceptions of past body overweight and past ideal weight (exercising women)

	PRE n= 25	
Past overweight	*f*	%
Yes	8	32%
No	17	68%
Total	25	100%
Age (years)	21.8* ± 6.3 16-32	
Different past ideal weight	*f*	%
Yes	12	48%
No	13	52%
Total	25	100%
Past ideal weight (kg)	55.1* ± 3.8 50-60**	
Age (years)	22.1* ± 3.4 17-27**	

* means and standard deviations; ** ranges.

Subjects' previous perceptions of body weight are presented in Table 23 , in which data are listed as means, standard deviations, ranges, frequencies, and percentages. The table shows that 8 (32%) of the women reported that they were overweight in the past when their mean age was 21.8 years. The table also shows that 12 (48%) of the group reported that they had a different ideal body weight in the past, when their mean age was 22.1 years. That past ideal body weight was 55.1 ± 3.8 kg, ranging from 50 to 60 kg.

The women were asked a series of questions on concerns about their bodies (see Appendix I). The first was to indicate from a list of body parts, which ones they felt were too fat. The second was, if they wanted to change these particular body parts, to indicate for what reasons (from a provided list). And the third was to indicate with which of the listed body parts they were satisfied in terms of fatness. The pre exercise measurement responses showed that the hips, stomach (upper abdomen), thigh, lower abdomen, and waist were the body parts that women felt were too fat; while the face, neck, chin, shoulders, upper arms, back, calves, and legs (overall) were the body parts women reported most satisfaction with in terms of fatness. 64% of them considered their hips were too fat. The reason for wanting to change the shape of their hips were first for personal satisfaction; and second to

find fitting clothes. 76% reported that their upper abdomen (stomach) was too fat and they wanted to change it for the following reasons: to find fitting clothes; for personal satisfaction; getting attraction; achieving physical fitness; keeping their husbands happy; and for better movement. 60% of the women reported that their thighs were too fat and suggested a change to find fitting clothes; to move better; and to achieve physical fitness. 60% reported that their lower abdomen was too fat and wanted a change for personal satisfaction; social desirability; to find fitting clothes; and for better perceived health. 60% of the women reported that their waist was too fat and wanted to change it to find fitting clothes; for personal satisfaction; to keep their husbands happy; and for better movement.

The mid exercise measurement data indicated similar, but less strong attitudes towards the hips, stomach, thigh, lower abdomen, and waist. The rest of the body parts that women were shown to be happy with in the pre programme measurement got similar responses from the women in the mid exercise measurements. Of those who reported dissatisfactions with some of their body parts, 60% reported that their hips were too fat and wanted to change to find fitting clothes; for personal satisfaction; to move better; to keep their husbands happy; for better perceived health; and to achieve physical fitness. 64% of the women reported that their upper abdomen (stomach) was too fat and suggested a change for personal satisfaction; social desirability; to find fitting clothes; to keep their husbands happy; to move better; for better perceived health; and to achieve physical fitness. 52% reported that their thighs were too fat and wanted a change to move better; to find fitting clothes; to achieve physical fitness; for personal satisfaction; and for social desirability. 48% reported that their lower abdomen was too fat and wanted to change to find fitting clothes; to move better; fear of chronic illness (e.g. hypertension); and to keep their husbands happy. 52% reported that their waist was too fat and wanted a change to find fitting clothes; for social desirability; and for personal satisfaction.

The post exercise measurement data indicated that, with the exception of the lower abdomen, women remained dissatisfied with their hips, stomach, thighs, and waist.

The same body parts women reported satisfaction with in the pre and mid exercise measurements did not change. The percentage of women who perceived that their hips were too fat reduced from 64% in the pre measurements to 60% in the mid measurement to 52% in the post measurements, which indicates that with the advancement of the exercise programme, some women changed their negative attitudes towards their hips and showed more satisfaction. The 52% of the women who reported that their hips were too fat indicated a desire to change for social desirability, and to find fitting clothes. 64% of the women still found their upper abdomen (stomach) too fat and wanted to change to find fitting clothes; personal vanity; personal satisfaction; social desirability; to keep their husbands happy; fear of chronic illness; for better perceived health; and to achieve physical fitness. 52% reported that their thighs were too fat and wanted a change to find fitting clothes, to move better, and to achieve physical fitness. 56% of the women reported that their waist was too fat and desired a change to find fitting clothes and for social desirability.

THE EFFECTS OF EXERCISE ON BODY COMPOSITION:

Table 24 shows the means and the standard deviations of the women's body composition variables measured at before, during, and after the exercise programme. The results of an ANOVA for repeated measures (F) and their adjusted significant level (P) are presented in the same table. With the exception of the triceps skinfold and thigh girth, all of the subjects' body composition measurements changed significantly over time (Table 24). It is well documented in the literature that aerobic exercise affects body mass and its components (fat mass and fat free mass), with a reduction in fat mass and percentage body fat, a possible increase in fat free mass (FFM), and a possible reduction in body mass (see literature review). In this study a somewhat similar trend was found. Table 24 shows that by the end of the programme women's body mass decreased by about 3 kg; percentage body fat decreased by 1%, and fat mass decreased by 2.1 kg.

Table 24

Pre, mid, and post exercise programme body composition measurements

VARIABLES	PRE n = 25	MID n =25	POST n= 25	F	P	ADJUSTED P
Body mass (kg)	78 ± 11.8	76.4 ± 10.9	75 ± 10.8	11.69	0.000***	0.001**
BMI ($kg.m^{-2}$)	30.6 ± 4.5	30 ± 4.2	29.5 ± 4.3	12.03	0.000***	0.001**
Triceps skf[a]	36.6 ± 8.2	36.7 ± 7	35.1 ± 6.3	2.87	0.06	n.s
Biceps skf	20.6 ± 8.1	20.3 ± 6.1	17.9 ± 6.3	7.58	0.001**	0.002**
Subscapular skf	35.1 ± 10.7	34.5 ± 9.8	32.7 ± 9	5.36	0.008**	0.009**
Suprailiac skf	40.8 ± 8.8	39.6 ± 7.5	36. ± 7.5	11.95	0.000***	0.000***
Abdomen skf	44.7 ± 11	42.7 ± 10.8	39.3 ± 10.1	31.23	0.000***	0.000***
Thigh skf	48 ± 9	48.2 ± 8.4	44.9 ± 7	9.45	0.000***	0.000***
% BF[b]	40.7 ± 4.5	40.5 ± 3.9	39.7 ± 3.8	7.27	0.002**	0.003**
FM [c]	32.0 ± 7	31.3 ± 6.1	29.9 ± 5.9	12.46	0.000***	0.001**
FFM [d]	46 ± 5.9	45.1 ± 5.7	45.1 ± 5.7	8.15	0.001**	0.003**
Calf skf	30.7 ± 6.3	32.2 ± 6.3	29.9 ± 6.1	5.51	0.007**	0.008**
Neck girth (cm)	34.3 ± 1.7	34.4 ± 1.6	33.9 ± 1.8	7.10	0.002**	0.002**
Biceps girth (cm)	35.6 ± 4.2	35.1 ± 3.9	34.8 ± 3.9	4.80	0.01*	0.01*
Bust girth (cm)	100.8 ± 8.1	100.7 ± 7	99.1 ± 6.3	3.75	0.03*	0.04*
Waist girth (cm)	82.1 ± 9.1	81.6 ± 7.8	79.8 ± 6.9	4.19	0.02*	0.02*
Abdomen girth (cm)	99.9 ± 9.0	99.1 ± 9.8	93.8 ± 10.4	13.80	0.000***	0.000***
Hips girth (cm)	107.8 ± 8.8	108.4 ± 7.6	106.3 ± 7.2	3.82	0.02*	0.04*
Thigh girth (cm)	63.5 ± 6.4	63.2 ± 5.9	63 ± 5.7	0.46	0.63	n.s
Calf girth (cm)	39.2 ± 3.2	39.8 ± 3.4	39.8 ± 3.5	5.27	0.009**	0.01*

* $P < 0.05$; ** $P < 0.01$; *** $P < 0.001$.

[a]- skinfold thickness measurements (mm); [b]- percentage body fat as calculated by Durnin and Womersley's equation; [c]- fat mass calculated from percentage body fat which derived from Durnin and Womersley's equation; [d]- Fat free mass calculated from Durnin and Womersley (1974).

FFM decreased significantly in the first 6 weeks (Tukey, $P < 0.05$), and then levelled off. During the second 6 weeks, 12 women gained between 0.18 to 2.65 kg FFM, whilst 13 women lost between 0.11 to 1.74 kg.

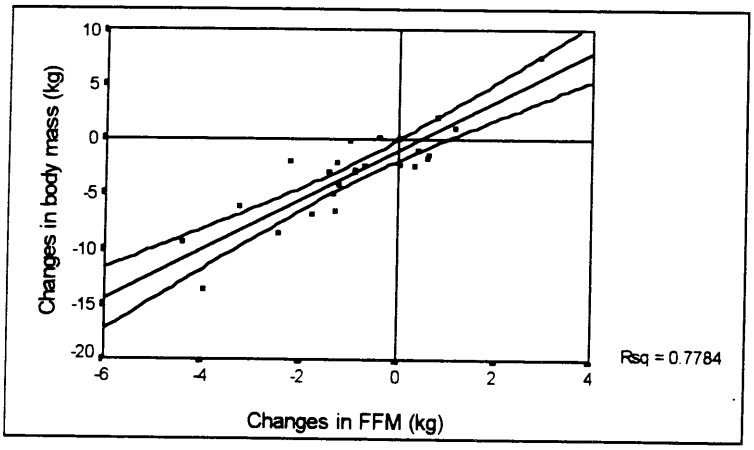


Figure 4 :Correlation coefficient between changes in body mass and changes in FFM

A scatterplot of changes in body mass versus changes in FFM is shown in Figure 4 and found to be significantly positive ($r = 0.88$, $P < 0.001$). The figure shows that those women who lost body mass also lost FFM, and those who gained mass also gained FFM. A similar correlation was found between changes in body mass and changes in fat mass with $r = 0.96$ and $P < 0.001$ (Figure 5). This indicates, as mentioned above that at the end of the programme, the women lost on average 3 kg of their body mass, which resulted from a reduction of 2.1 kg in fat mass and 0.9 kg of FFM.

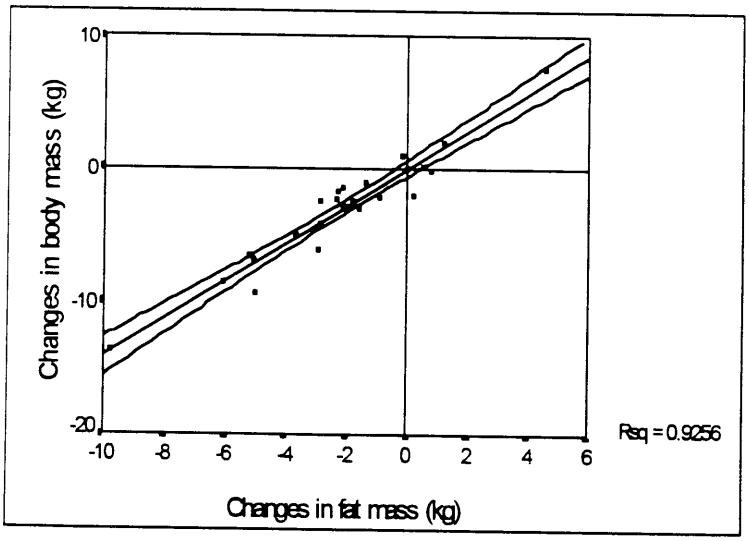


Figure 5: Correlation coefficient between changes in body mass and changes in fat mass

In general, the skinfold and girth measurements showed a trend to decrease during the first 6 weeks of the programme and continued significantly towards the end of the programme (Tukey, $P < 0.05$).

THE EFFECTS OF EXERCISE ON PHYSICAL FITNESS:

Table 25
Pre, mid, and post exercise programme physical fitness measurements

VARIABLES	PRE n = 25	MID n = 25	POST n = 25	F	P	ADJUSTED P
Physical work capacity (kgm/min)	896.8 ±316.4	937 ± 277.8	1053 ±197.6	3.10	0.05	n.s
Vo_2 max ($l.min^{-1}$)	2.1 ± 0.7	2.2 ± 0.6	2.4 ± 0.5	2.47	0.09	n.s
Vo_2 max ($ml.kg^{-1}.min^{-1}$)	27.7 ± 9.7	29.2 ± 8.4	32.93± 7.5	4.10	0.02*	0.03*
Bench press (repetitions)	11.7 ± 8.9	12.5 ± 8.7	13.8 ± 8	1.12	0.34	n.s
Sit-ups (times)	8.2 ± 7.6	16.2 ±7.8	19.6 ± 9.1	51.21	0.000***	0.000***
Trunk flexibility (cm)	8.4 ± 3.1	9.8 ± 2.8	10.8 ± 2.6	15.57	0.000***	0.000***

* $P < 0.05$; *** $P < 0.001$.

Table 25 lists the means and the standard deviations of the women's physical fitness scores measured pre, mid, and post exercise programme. Across the three measurements, the women's cardiorespiratory fitness as measured by the cycle ergometer test improved gradually. They showed the capability to endure more work on the cycle ergometer at a given submaximal heart rate. Furthermore, the women's oxygen uptake (litres per minute) increased, as expected, from pre to mid to post exercise measurement, though these changes were not statistically significant. When body mass was considered in the calculation, the women's maximal oxygen uptake (millilitres per kilogramme of body weight per minute) increased significantly (Table 25), between pre and post exercise, (Tukey, $P < 0.05$).

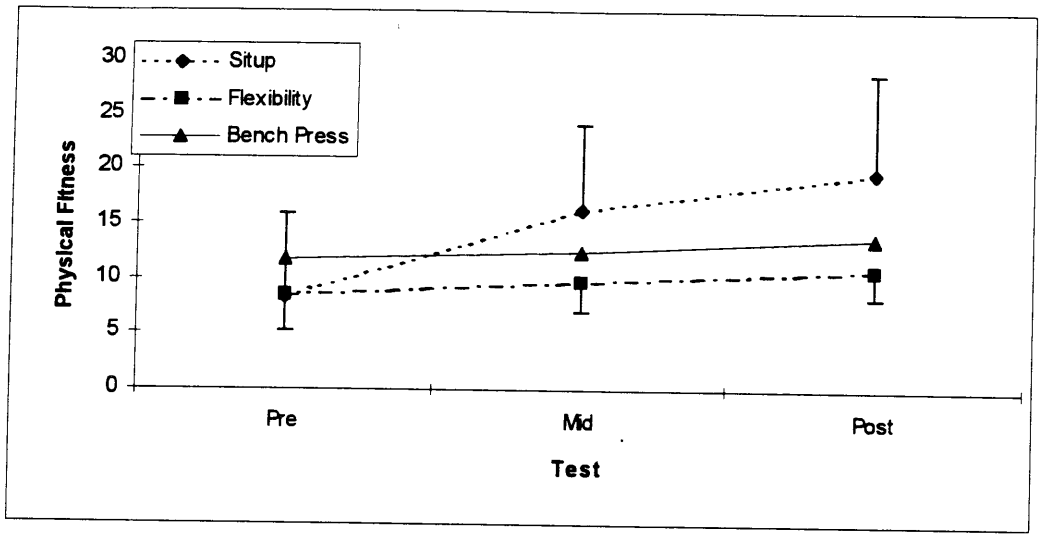


Figure 6: Exercise effects on the women's physical fitness parameters

The other measures of the women's physical fitness (i.e. muscular strength and endurance; and trunk flexibility) improved with the exercise programme. Abdominal muscular endurance measured by the number of sit-ups in one minute showed a sharp and significant increase from pre to mid exercise, and continued to improve until the end of the programme (Figure 6); with the Tukey test indicating significant improvements across the three measurements ($P < 0.05$). The data show that by the end of the programme, 23 of the women performed between 2 and 26 more sit-ups than they did in the pre exercise measurement. The bench press test was another measure of the women's upper body endurance which showed a gradual improvement across time, although the differences between pre and post exercise test were not statistically significant. By the end of the programme, the majority of the women (18) improved in this test, as they performed between 1 to 13 time more repetitions, although these changes were not statistically significant.

The women's flexibility results as measured by the trunk flexion (sit and reach) test are presented in Table 25 and Figure 6. The mean flexibility values showed a significant and a gradual improvement from pre to mid and post exercise, with the Tukey test indicating significant improvements between the three measurements ($P < 0.05$). Twenty-one of the women improved in this test, and the distances of improvement were between 0.20 to 7 cm. Change in trunk flexibility was found to correlate

significantly and negatively with changes in body mass ($r = -0.40$, $P < 0.05$); FFM ($r = -0.51$, $P < 0.01$); and positively with the sit-up test ($r = 0.53$, $P < 0.01$). This implies that those women who lost more body mass and FFM, improved more in flexibility than those who did not lose mass.

THE EFFECTS OF EXERCISE ON SELF-ESTEEM VARIABLES:

Table 26 shows the means and the standard deviations of the women's global and physical self-esteem recorded for pre, mid and post exercise measurements. The global self-esteem score is the sum of the 25 item scores of the Self-esteem Inventories (Coopersmith 1991), with 100 as a maximum self-esteem score. Physical self-esteem is the five sub-scales of the physical self perception profile (PSPP) (sport competence; physical condition; body attractiveness; physical strength; and physical self worth), with a maximum score of 25 for each subscale. Finally the four sub-scales of the perceived importance profile (PIP) (sport importance; condition importance; body importance; and strength importance), have a maximum score of 8 for each subscale. The differences between pre, mid and post exercise measurements for each variable, calculated by ANOVA for repeated measures (F), and the level of significance (P) are presented in Table 26.

Table 26

Pre, mid, and post exercise programme measurements of the global self-esteem, the Physical Self Perception Profile (PSPP), and the Perceived Importance Profile (PIP)

VARIABLES	PRE n = 25	MID n = 25	POST n = 25	F	P	ADJUSTED P
Global self-esteem	69.44 ± 16.33	69.12 ± 16.47	70.40 ± 14.79	0.11	0.89	n.s
Sport competence (PSPP)	16.80 ± 3.11	17.40 ± 2.42	17.80 ± 3.46	1.50	0.23	n.s
Physical condition (PSPP)	16.04 ± 3.56	16.56 ± 2.89	17.16 ± 4.23	1.56	0.22	n.s
Body attractiveness (PSPP)	13.92 ± 3.24	15.36 ± 3.30	15.12 ± 3.19	5.12	0.01*	0.01*
Physical strength (PSPP)	14.96 ± 2.78	15.88 ± 2.95	15.88 ± 3.23	1.68	0.20	n.s
Physical self worth (PSPP)	14.52 ± 2.29	15.32 ± 3.13	15.32 ± 3.22	1.20	0.31	n.s
Sport importance (PIP)	6.92 ± 1.12	6.68 ± 1.31	6.60 ± 0.96	0.78	0.46	n.s
Condition importance (PIP)	6.00 ± 1.29	6.00 ± 0.96	6.00 ± 1.04	0.00	1.00	n.s
Body importance (PIP)	6.76 ± 1.23	6.72 ± 1.24	6.16 ± 1.03	2.87	0.06	n.s
Strength importance (PIP)	5.64 ± 1.55	6.08 ± 1.29	5.80 ± 1.32	1.41	0.25	n.s

* $P < 0.05$.

The table indicates that, with the exception of the body attractiveness subdomain of the PSPP, none of the self-esteem variables improved significantly with exercise. Women's perceptions of their body attractiveness were enhanced by exercise, as their scores in that item increased from pre to mid exercise measurements, and from pre to post exercise (the Tukey test was significant for both measures with $P < 0.05$). Nonetheless, Figure 7 shows that all of the PSPP variables improved.

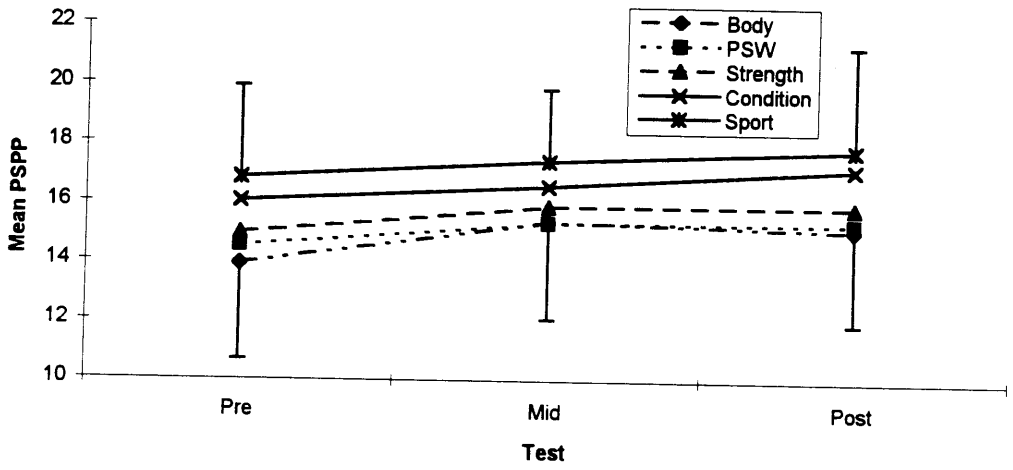


Figure 7: The effects of exercise on the PSPP items

The data showed that by the end of the programme, the majority of the women improved in their global and physical self-esteem scores. Post exercise measurements compared to pre exercise indicated that 18 of the women scored higher in the body attractiveness sub-scale of the PSPP (Tukey test was significant at $P < 0.05$); 13 women showed improvement in the physical condition sub-scale of the PSPP; 15 women scored higher in sport sub-scale; 13 women improved in their physical strength sub-scale; 12 scored higher in physical self worth; and 12 improved in their global self-esteem scores.

The importance of sport competence, physical condition, body attractiveness, and physical strength to the sample group of this study as measured by the PIP is shown in Table 26. It can be seen that between the pre and post exercise measurement the women's perceived importance of the physical strength increased, while body

attractiveness became less important: however these changes are not statistically significant, so these trends need to be interpreted with caution.

THE EFFECTS OF EXERCISE ON BODY IMAGE:

1. BODY CATHEXIS:

The women's mean body cathexis scores (BC) for the pre, mid and post exercise measurements are listed with their standard deviations in Table 27. Changes in the BC values across the three measurement times were calculated by ANOVA for repeated measures, in which the value of F and their significance (P) are presented in the table. It should be noted that at first, an attempt was made to factor analyse the BCS in order to monitor the changes in the factors across time, but as mentioned in phase I of this chapter, the factor analysis procedure did not work, and therefore has not been included in this study.

A reminder of the scoring system of the BCS may be helpful. The BCS score was calculated from the sum of the items scores, in which each item is scored by referring to a five point Likert scale, with 1= very dissatisfied, 2 = satisfied, 3 = neutral, 4 = satisfied, and 5 = very satisfied. The total BC score showed a trend towards improvement, particularly during the first six weeks of the programme, although the changes were not statistically significant. This increase in the total BC scores could be attributed to the improvement in the women's feelings towards some of the BC items (body build, legs, pain tolerance, profile, and weight), in which their scores showed a consistent increase from pre to mid and to post exercise measurements (Table 27). The BC items that showed significant changes across time were weight; profile; and waist (Table 27); with the Tukey test indicating that the three items improved significantly during the first six weeks of the programme ($P < 0.05$), and that both the weight and the profile items continued to improve significantly until the end of the programme ($P < 0.05$).

Table 27

Pre, mid, and post exercise programme measurements of the body cathexis scores

VARIABLES	PRE n = 25	MID n = 25	POST n = 25	F	P	ADJUSTED P
Age	4.28 ± 0.61	4.24 ± 0.52	4.04 ± 0.79	1.89	0.16	n.s
Appetite	3.16 ± 1.28	3.32 ± 1.31	3.08 ± 1.12	0.57	0.57	n.s
Arms	3.56 ± 0.77	3.44 ±1. 08	3.52 ± 0.77	0.17	0.85	n.s
Body build	3.24 ± 1.20	3.28 ± 1.10	3.32 ± 1.18	0.06	0.94	n.s
Back	3.08 ± 1.15	3.32 ± 1.03	3.32 ± 0.90	0.54	0.58	n.s
Breasts	3.24 ± 0.88	3.04 ± 1.17	3.32 ± 0.95	1.36	0.26	n.s
Chest	3.28 ± 0.94	3.12 ± 1.33	3.48 ± 0.82	1.26	0.29	n.s
Chin	3.84 ± 0.85	3.56 ± 0.92	3.72 ± 0.79	0.95	0.39	n.s
Co-ordination	3.60 ± 0.76	3.40 ± 1.19	3.44 ± 0.92	0.45	0.64	n.s
Digestion/ Elimination	3.76 ±1.01	3.96 ± 0.61	3.84 ± 0.80	0.65	0.53	n.s
Energy level	3.28 ± 0.98	3.24 ± 0.93	3.56 ± 0.77	1.28	0.29	n.s
Ears	4.08 ± 0.57	3.80 ± 0.76	3.80 ± 0.87	1.96	0.15	n.s
Eyes	4.12 ± 0.73	3.92 ± 1.04	3.84 ± 0.80	2.42	0.09	n.s
Facial complexion	3.68 ± 1.14	3.36 ± 1.04	3.32 ± 1.03	2.41	0.10	n.s
Face	3.80 ± 0.76	3.92 ± 0.64	3.80 ± 0.58	0.46	0.63	n.s
Flexibility	3.20 ±1.12	3.68 ± 0.85	3.64 ± 0.86	3.39	0.04*	0.05
Hair distribution	3.80 ± 1.15	3.76 ±1.01	3.48 ± 1.12	2.31	0.11	n.s
Hair	3.64 ± 1.11	3.44 ± 1.16	3.48 ± 1.23	0.57	0.57	n.s
Hands	4.04 ± 0.89	3.92 ± 0.76	3.76 ± 0.72	1.16	0.32	n.s
Health	3.68 ± 0.99	3.88 ± 0.73	3.84 ± 0.80	0.67	0.52	n.s
Height	3.68 ± 1.11	3.60 ± 1.04	3.68 ± 1.11	0.08	0.93	n.s
Hips	2.28 ± 1.24	2.56 ± 1.36	2.40 ± 1.04	0.86	0.43	n.s
Keenness of senses	4.16 ± 0.94	4.16 ± 0.75	3.88 ± 1.01	1.74	0.19	n.s
Knees	3.24 ± 1.13	3.32 ± 1.07	3.12 ± 1.24	0.67	0.52	n.s
Legs	3.04 ± 1.27	3.20 ± 1.15	3.24 ± 1.09	0.54	0.59	n.s
Muscular strength	3.44 ± 0.82	3.36 ± 0.86	3.56 ± 0.77	0.55	0.58	n.s
Muscle tone	3.00 ± 1.15	3.24 ± 1.20	2.96 ± 1.27	0.93	0.40	n.s
Nose	3.76 ± 1.05	3.72 ± 0.94	3.64 ± 1.04	0.21	0.81	n.s
Overall appearance	2.92 ± 1.22	3.12 ±1.20	2.88 ± 1.17	1.03	0.36	n.s
Physical skill	3.32 ± 0.99	3.80 ± 0.58	3.52 ± 0.96	2.86	0.06	n.s
Physical stamina	3.60 ± 1.00	3.64 ± 0.76	3.56 ± 0.77	0.08	0.92	n.s
Pain tolerance	3.52 ±1.08	3.68 ± 0.75	3.76 ± 0.72	0.96	0.39	n.s
Profile	2.20 ± 0.91	2.76 ± 1.05	2.80 ± 0.91	5.12	0.01*	0.1*
Resistance to illness	3.44 ± 0.96	3.68 ± 0.80	3.44 ± 0.82	1.35	0.27	n.s
Shoulder width	3.28 ± 1.02	3.44 ± 1.00	3.16 ± 0.90	1.16	0.32	n.s
Sleep	3.40 ± 1.00	3.64 ± 0.91	3.64 ± 0.91	0.92	0.41	n.s
Teeth	3.60 ± 0.76	3.56 ± 1.08	3.60 ± 0.82	0.04	0.96	n.s
Voice	4.00 ± 0.50	4.00 ± 0.76	3.92 ± 0.49	0.23	0.80	n.s
Waist	1.96 ± 0.89	2.72 ± 1.21	2.36 ± 1.08	7.40	0.002**	0.002**
Weight	1.68 ± 0.85	1.92 ± 1.00	2.08 ± 0.95	3.32	0.04*	0.04*
Total	135.88 ± 17.54	138.72 ± 18.30	136.80 ± 21.32	0.48	0.62	n.s

* P < 0.05; ** P < 0.01.

The women's attitudes toward their profile became more positive from pre to mid exercise, and from pre to post exercise, although their mean score remained in the dissatisfaction zone (Table 27). Feelings toward the waist item increased from very dissatisfied (1.96) for the pre exercise measurement to dissatisfied (2.72) for the mid measurement. Similarly, attitudes toward the weight item improved from very dissatisfied to dissatisfied. This gradual improvement in the women's attitudes toward

these parts of their bodies may not be large, but they are improving consistently and in a positive way in response to the exercise programme.

The women were least satisfied with the body parts and functions that were visible and which contribute to body weight and shape i.e. hips, profile, waist, weight, muscle tone, and overall appearance, while they were more satisfied with those less obvious body parts and functions such as ears; voice; keenness of senses; and age (Table 27). Women's attitudes towards body parts and functions related to physical fitness (i.e. energy level; muscular strength; and flexibility) showed a positive trend of change; thus as the exercise programme progressed, the women felt more positive about their physical fitness related items. These correspond with the actual improvement in their physical fitness.

Some of the body items showed an improvement during the first six week of the programme, and from then towards the end of the programme they showed a tendency to regress; these items were related to body shape, health and fitness (e.g. appetite; digestion/elimination; flexibility; health; hips; knees; muscle tone; overall appearance; physical skill; physical stamina; resistance to illness; waist; and shoulder width). This could be attributed to the women's high expectations of a rapid change in these areas of the body, in which after their realisation of the exact changes in their bodies, their post exercise attitudes towards these body parts and functions decreased.

In summary, although factor analysis procedures were not performed on the BCS; ANOVA for repeated measures on each body parts and functions indicates some significant improvements and other positive trends with progression through the exercise programme. Thus changes in each individual body part or function were studied thoroughly, and compared to the corresponding changes in body composition and self-esteem variables. It was found that the women's attitudes towards those items related to body mass and shape (profile, waist, and weight) improved significantly, however the scores remained in the dissatisfaction zone. These improvements were not significantly correlated with improvements in the

measured mass, waist girth, abdominal girth and skinfold. On the other hand, improvements in the feelings towards weight and hips items of the BCS were found to correlate positively and significantly with improvements in global self-esteem ($r = 0.50$, $P < 0.05$; and $r = 0.71$, $P < 0.001$ respectively). Also improvements in waist and overall appearance items correlated positively and significantly with improvements in physical self worth domain of the PSPP with $r = 0.42$, $P < 0.05$; and $r = 0.51$, $P < 0.01$, respectively. For those women whose feelings towards their weight and hips became more positive, their self-esteem improved, and those whose feelings towards their waist and overall appearance improved, also improved in the way they think about their physical self. Overall, it appears that the effects of this study's exercise programme on the psychological variables were less immediate than the physiological ones. Nonetheless there were signs of improvements; some were statistically significant and some were in the right direction.

2. PERCEPTIONS OF BODY SHAPE AND SIZE:

The women's perceptions of their own figure and their ideal figure were measured by nine female silhouettes (Stunkard et al 1983), ranging from 1 (very thin) to 9 (very fat), these silhouettes were presented in three forms: (1) nude; (2) dressed in Western clothes; and (3) dressed in Islamic clothes.

Table 28 and Figure 8 show the women's perceptions of their current figure and their ideal female figure, the data are presented in means and standard deviations. ANOVA for repeated measures (F) and the significance of (F) are also shown in the same table. Overall, as seen from Table 28 and Figure 8, the women perceived their current (nude, Western, and Islamic) to be larger than their ideal female figure. With the advancement of exercise, the gap between the current and the ideal nude, Western, and Islamic became closer, where the current becoming significantly thinner (Tukey, $P < 0.05$), and the ideal becoming fatter; only the Islamic ideal was significantly fatter, (Tukey, $P < 0.05$).

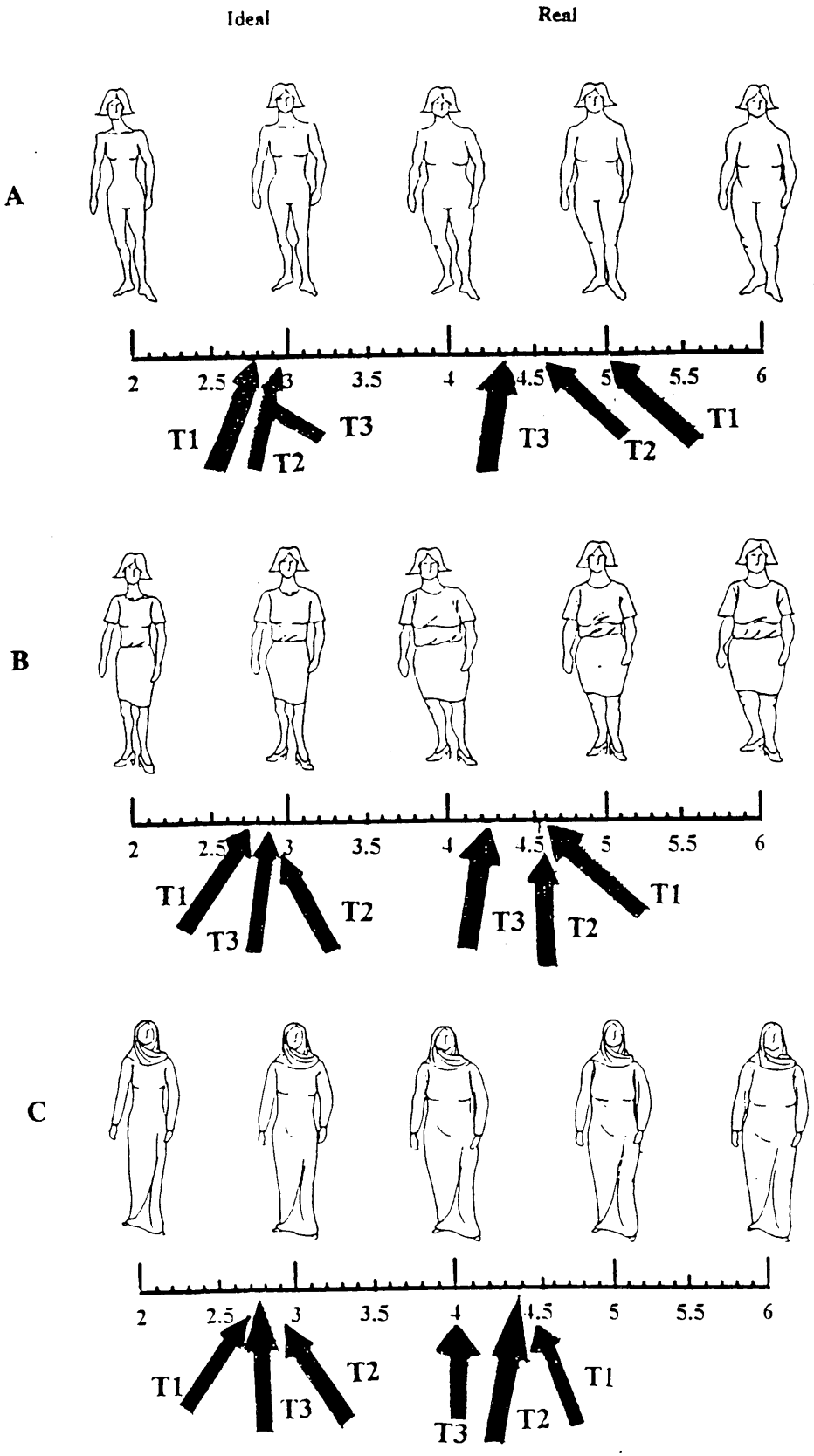


Figure 8: The women's perception of their (A) real and ideal nude figures; (B) real and ideal Western-dressed figures, and (C) real and ideal Islamic-dressed figures measured at pre-exercise (T1), mid-exercise (T2), and post-exercise (T3).

Table 28

Pre, mid, and post exercise programme measurements of nude body image, nude ideal body image, Western-dressed body image, Western-dressed ideal body image, Islamic-dressed body image, and Islamic-dressed ideal body image, and perceived current and ideal mass

VARIABLES	PRE n = 25	MID n = 25	POST n = 25	F	P	ADJUSTED P
Body image 1	5.00 ± 1.44	4.52 ± 1.29	4.32 ± 1.14	7.90	0.001**	0.002**
Ideal body image 1	2.80 ± 0.65	2.96 ± 0.79	2.96 ± 0.73	1.48	0.24	n.s
Body image 2	4.60 ± 1.32	4.52 ± 1.26	4.24 ± 1.16	3.71	0.03*	0.04*
Ideal body image 2	2.76 ± 0.60	2.92 ± 0.76	2.88 ± 0.83	1.32	0.28	n.s
Body image 3	4.44 ± 1.45	4.40 ± 1.22	4.00 ± 1.12	5.74	0.006**	0.006**
Ideal body image 3	2.68 ± 0.56	2.96 ± 0.79	2.72 ± 0.74	3.36	0.04*	0.04*
Perceived mass (kg)	76 ± 12.1	75.8 ± 11	75 ± 10.7	3.25	0.04*	0.07
Ideal mass (kg)	60.3 ± 6.2	61.2 ± 7.2	61.8 ± 7.5	2.18	0.12	n.s

* $P < 0.05$; ** $P < 0.01$.

To determine whether there were significant changes between the women's perceptions of their current and their ideal nude and dressed (Western and Islamic) female figure with the participation in the exercise programme, a repeated measure ANOVA (dress x real/ideal x time) was performed. The Tukey test was also performed to suggest at what stage significant differences occurred. The results indicated that there was a significant main time effect ($F = 8.42$, $P < 0.001$), and a significant real/ideal by time interaction ($F = 15.78$, $P < 0.001$). The Tukey test suggested that the differences between perception of the current figure and the ideal figure across the three time measurements (pre, mid, and post exercise) were significant ($P < 0.05$). On the other hand, the analysis revealed that there were no significant effects of dress on the women's perceptions of their current figure or their ideal female figure.

In conjunction with these findings, the last two rows in Table 28 indicated, that although not statistically significant, with exercise women's perceptions of their body mass became lighter, whereas their perceptions of their ideal mass became heavier. Thus it can be argued that the three months exercise programme resulted in significant changes in the women's perceptions of their current figure and their ideal female figure, as the former became thinner and the later became fatter. This

could suggest that the women developed more realistic views of the female figure, and across time the ideal became closer to their mean current figure.

Table 29
Correlation coefficients between changes in women's perceptions of their current (1) nude, (2)Western-dressed, and (3) Islamic-dressed figure and changes in their body composition variables

Variables	Body mass	BMI	% BF
Body image 1	0.67**	0.66**	0.47*
Body image 2	0.48*	0.47*	0.40*
Body image 3	0.43*	0.43*	n.s

* P < 0.05; ** P < 0.001.

The changes in the women's perceptions of their current figures became thinner over time as their body mass, BMI, and their percentage body fat decreased with the exercise programmes. The correlation coefficients between changes in the women's perception of their current figures and the changes in their body composition measurements were significantly positive (Table 29). This implies that as the women get thinner they also perceived their figures to be thinner.

Table 30
Pre, mid, and post exercise programme measurements of current and ideal body image (1 = undressed, 2 = dressed into Western, 3 = dressed into Islamic) of the married subjects (n = 19) and their spouses (n = 19)

VARIABLES	PRE	MID	POST	F	P	ADJUSTED P
Wives body image 1	5.05 ± 1.47	4.58 ± 1.30	4.47 ± 1.17	7.76	0.002**	0.003**
Husbands body image 1	4.95 ± 1.13	4.84 ± 1.26	4.42 ± 1.12	6.87	0.003**	0.005**
Wives ideal body image 1	2.68 ± 0.67	2.95 ± 0.85	2.95 ± 0.78	3.54	0.03*	0.03*
Husbands ideal body-image 1	3.11 ± 0.74	3.21 ± 0.79	3.32 ± 0.95	2.12	0.13	n.s
Wives body image 2	4.68 ± 1.42	4.58 ± 1.30	4.47 ± 1.22	1.54	0.23	n.s
Husbands body image 2	4.58 ± 1.31	4.68 ± 1.20	4.32 ± 1.06	2.65	0.08	n.s
Wives ideal body image 2	2.68 ± 0.67	2.89 ± 0.81	2.95 ± 0.91	3.38	0.04*	0.04*
Husbands ideal body image 2	3.00 ± 0.67	3.16 ± 0.83	3.32 ± 0.89	2.98	0.06	n.s
Wives body image 3	4.52 ± 1.58	4.42 ± 1.26	4.16 ± 1.21	4.13	0.02*	0.02*
Husbands body image 3	4.68 ± 1.46	4.68 ± 1.34	4.26 ± 1.10	4.80	0.01*	0.02*
Wives ideal body image 3	2.58 ± 0.61	2.95 ± 0.78	2.79 ± 0.79	4.97	0.01*	0.01*
Husbands ideal body image 3	3.00 ± 0.75	3.16 ± 0.83	3.11 ± 0.88	0.87	0.43	n.s

* P < 0.05; ** P < 0.01.

Table 30 presents data of the married women's and their husbands' mean perceptions of the wives' current figures, and their ideal female figure (nude, Western, Islamic). In a similar fashion to the whole sample, the 19 married women showed that their perceptions of their nude and their dressed figures became thinner as exercise advanced. The post exercise values differed significantly from the pre exercise values for the nude and the Islamic female silhouettes (Tukey test, $P < 0.05$). The married women's perception of their Western-dressed figure was in a similar direction, though not significant. The ideal female figure (nude, Western, and Islamic) became significantly fatter over time, with the Tukey test indicating significant differences ($P < 0.05$) between pre and post exercise values for the Western-dressed ideal, pre and mid exercise for the Islamic-dressed ideal, and between pre and mid and pre and post exercise values for the nude ideal female figure.

Similarly, the husbands' perceptions of their wives' figures became thinner across time, with the perception of the nude and the Islamic wives' figures changing significantly during the second six weeks of the programme (Tukey, $P < 0.05$). The husbands' ideal female figure became fatter as the programme advanced: these changes agreed with those reported above for their wives, though they were not statistically significant. Both the husbands and their wives perceived the current wives' figures to be fatter than their ideal female figures (nude, Western, and Islamic) for the pre; mid; and post exercise measurements, although the gap between the current wives' figure and the ideal female figure became narrower as the exercise continued.

To find out whether there were significant differences across time between the wives and their husbands in the way they perceived their current and the ideal female figure, with considerations of the effect of dress on their perceptions, a repeated measure ANOVA (gender x real/ideal x dress x time) was conducted. The Tukey post hoc test was also performed to suggest where these changes took place. The ANOVA indicated significant main time effect ($F = 6.05$, $P < 0.01$), significant real/ideal by time interaction ($F = 33.10$, $P < 0.001$), and significant current/ideal by gender by time interaction ($F = 3.68$, $P < 0.05$). This analysis indicated that there were no dress effects, thus the females and their husbands perceived, regardless of dress, the

current wives figures significantly fatter than their ideal female figure (Tukey, $P < 0.05$). These differences between the current wives figures and ideal female figure became significantly smaller across time (Tukey, $P < 0.05$)

Table 31

Pre, mid, and post measurement values of the actual, perceived and ideal body mass of the married women (n = 19) and their spouses (n = 19)

VARIABLES	PRE	MID	POST	F	P	ADJUSTED P
Wives actual mass (kg)	76.9 ± 10.7	75.4 ± 10	74.2 ± 9.9	12.26	0.000***	0.001**
Wives perceived mass (kg)	75.3 ± 10.5	75 ± 10.3	74.1 ± 10	1.08	0.35	n.s
Wives ideal mass (kg)	58.9 ± 4.6	59.8 ± 6.2	60.1 ± 6.5	1.06	0.36	n.s
Husbands perceived mass (kg)	75 ± 11.6	74.5 ± 9.9	73.1 ± 8.9	1.78	0.18	n.s
Husbands ideal mass (kg)	61.8 ± 7.9	64 ± 7.8	63.2 ± 6.1	1.94	0.16	n.s

** $P < 0.01$; *** $P < 0.001$.

Table 30 shows that the husbands perceived their wives' bodies (nude, and Western) to be thinner than the wives thought their figures were, with the exception of the mid exercise measurement. On the other hand, the husbands' ideal female figure was fatter than that of their wives', and appeared even to get fatter between pre to mid and post exercise measurements, although the differences were not significant. Similar but not significant differences were found between the wives' and the husbands' perceptions of the wives' body mass and the ideal female mass (Table 31). The husbands perceived their wives' mass to be lighter than that reported by the wives, and lighter than the wives' actual mass. The ideal female mass reported by the husbands was heavier than that reported by the wives. Both the perceived and the ideal female mass changed with exercise for both husbands and wives, with the ideal becoming heavier and the perceived mass becoming lighter, although neither change was statistically significant.

In summary, the exercise programme sample group showed significant changes in their perceptions of their current figure (nude, Western, and Islamic), with perceptions of their figures becoming thinner over time. The women showed a tendency to idealise a thinner female figure than their own, although over time this ideal female figure

became fatter and closer to their current figure. By the end of the programme, the subjects perceived their body weight to be lighter and their ideal weight to be heavier. In respect of the men's opinions of the women's bodies, both the wives and their husbands showed a similar pattern of change to the whole group. It appeared that dress had no significant effect on the whole group of women's or the married women's and their husbands' perceptions of current or the ideal female figure.

CHAPTER V
DISCUSSION

The literature reviewed in this research indicated that Western and North American women are preoccupied with their body shapes and sizes; that thinness is desirable; and that this affects them (associated problems are believed to range from eating disorder diseases to the prevalence of obesity among Western women). Several studies indicate that this admiration of thinness, however it exists, is less pronounced in non-Western societies (i.e. Egypt). However, some authors claim that the degrees of thinness desired by Western women are also admired by non-Western women, especially among women from societies where Western influence is apparent (e.g. Hong Kong).

Although Bahrain is a Middle Eastern Muslim and traditional country, it is influenced by the West. A few decades ago, Bahrain went through rapid social and economic changes. Western ideas and values were introduced to Bahrainis through various channels: first, Western technology and educational systems were used as models in Bahrain; second, Western goods, traditional and cultural values, and ways of life, were brought to Bahrain by foreigner experts and workers (Western and non-Western; among them were Middle Eastern workers who were also influenced by the West), and also by Bahrainis (males and females) who had studied in the West. The Western ideal female figure is portrayed everywhere in Bahrain, in various sources of the media (the Bahraini and the foreigner channel T.V, the 24 hour satellite services, national and the international magazines, books, and news papers), and mannequins displayed in the shop windows.

Whether Bahraini women and Bahraini culture are directly influenced by this Western ideal female body is not yet known, since no research on this has been conducted. Hence, one of the objectives of the multi-disciplinary study was to explore psychological and sociological (culture, tradition, religion, Bahraini men's opinions, and Western) aspects of Bahraini women's bodies, and to relate these aspects to the current physiological status of their bodies. The other part of the study aimed to study the effects of a three month

exercise intervention on the Bahraini women's body composition, body image, general and physical self-esteem, and physical fitness scores.

Due to the absence of research in this area in Bahrain, many of this research's methods, instruments, and design were based on Western models, with modifications, if applicable. Cultural, traditional, and religious constraints (see Chapter III) led to several limitations for this study; for example, the sample size in each group was small and was not randomly selected as representative of the Bahraini women population. However, considering the small size of the country (693 sq. km) and the small number of women in the population (159,367), the sample groups of this study could be considered indicative of their age groups, since the sample was drawn to represent different sectors of Bahraini women (working women, students, house wives, and unemployed women), and from various cities and villages in Bahrain. Therefore, inferences and conclusions from the findings of this study could be drawn for similar age groups of Bahraini women and men, and some will apply to others who share the same background (e.g. Muslim, Middle Eastern, from the Arabian Gulf countries, influenced by the West).

A reminder of the population studied in this research would be helpful. The sample groups of the first phase were 30 younger women (20-25 yr.), 30 older women (50-55 years), 11 younger men aged between 23 to 33 years (the husbands of the married younger women), 17 older men aged between 45 to 70 years (the husbands of the older married women), and 106 independent group of Bahraini men (not related to the other sample groups) aged between 18 to 55 years.

The sample groups of the second phase were 25 women (those who completed the exercise intervention) aged between 20 and 42 years, and 19 men (the husbands of the married women) aged between 27 and 47 years.

As with the previous two chapters, the discussion of the two phases' findings will be presented separately.

PHASE I:

The physiological findings for the younger and the older Bahraini groups of women indicated that both groups are overweight and obese. How overweight and obese these women are can only be decided by referring to arbitrary values of body fat or body weight reported in the literature. Such values are based on standard or normal values of certain populations (e.g. American). To clarify, several indicators have been used to indicate obesity and overweight e.g. BMI; percentage body fat; relative weight; calculation of fat cell numbers and sizes. BMI and percentage body fat are the most widely used methods for the determination of obesity, and height-weight tables such as Metropolitan Life Insurance tables are used for the determination of ideal weight and how much overweight a person is. Although researchers have not reached agreement on what percentage body fat should be considered to define obesity, McArdle et al (1994) consider a value greater than 30% body fat as the onset of obesity for women. This criterion is based on data from a number of studies on American adults aged between 17 and 50 years. Wilmore and Costill (1994) suggested similar values of percentage body fat as the borderline for obesity in women (30 - 35%). These indicators of obesity were assigned to older and younger women. However, it is well documented that as individuals grow older, the amount of fat in their bodies increases (Dr Buskirk, A round table 1986). Researchers believe that this accumulation of body fat at older ages could be due to other reasons, such as decrease in activity level and/or a decrease in older individuals' resting metabolic rate. McArdle et al (1994) and Dr. DiGirolamo (A round table 1986) therefore do not consider this increase in body fat in old age as a reason to elevate the norm of obesity for older people. It is not yet clear whether ageing or other environmental factors are responsible for the reported changes in body shape and composition of both men and women (Going et al 1995; Durnin & Womersley 1974; Singal & Sidhu 1983). This study suggests that the body composition measurements of the younger women differed from those of the older women. The younger Bahraini women were shown to be significantly thinner, lighter, and taller than their older counterparts. With the exception of the fat free mass (FFM) and height, which were lower in the

older women, all the skinfold and girth measurements, body mass, fat mass, and percentage body fat were greater in the older women. The higher values for the older women's body composition may be attributed to the increase in body fat of the older subjects. These findings are in agreement with the findings of Pollock et al (1975); Durnin and Womersley (1974); Singal and Sidhu (1983), who found that differences in the body composition of the younger and older women in their studies were due to the increase in body fat of the older women. However, it would be premature to conclude that the larger body composition measurements of the older Bahraini women are merely due to ageing process, since the data are based on comparison between two separate age group cohorts.

The literature provides data relating to both biological and environmental factors and the interaction between them as contributors to the bodily changes in the aged (Going et al 1995). With advancement in age, the body undergoes several changes: body fat (adipose tissue) increases progressively from the third decade, and then starts to decline after the age of 70 years. Body mass and fat mass also increase, with fat free mass (FFM) remaining stable until about the age of 50 years, when they start to decline (Going et al 1995). Singal & Sidhu (1983) reported an even earlier decline in women's lean body mass (during the age range 35-39 years). The decline in FFM is believed to be due to the decline in the mineral content of the bone, which is estimated to be about 1% in women, starting from the age of 50 years (Durnin & Womersley 1974). FFM declines as its other components decline: potassium, water, protein; and nitrogen. Going et al (1995) noted that there is also a loss in height with ageing. The body fat in older women shifts from the periphery and becomes more internalised, which would change the shape of the body as the person aged, even though the body mass may remain the same. In addition to the ageing process, there are other factors such as decline in activity level and the resting metabolic rate in the older population, which result in decrease in energy expenditure. The effects of physical activity on bone mass, muscle mass, bone density, and the rate of muscle loss in older populations are reported to be positive (cited in Going et al 1995).

BMI is another method used widely in clinical sittings to differentiate between obese and non obese persons. It should be noted that BMI is not a measure of body fatness, but is an indicator of adiposity. Wilmore and Costill (1994) pointed out the BMI is related to body composition, and can be used to indicate obesity, especially in the absence of body fatness measures. The BMI definition of obesity differs between investigators. For example, Garrow (1983) considered a BMI value over 25 as the onset of obesity, while Dr. DiGirolamo (A round table 1986), considered a higher value of BMI (> 27) as an indicator of obesity for women. The Allied Dunbar National Fitness Survey (1992) used a BMI value above 28 as the onset of obesity for women. Due to the absence of such norm based data for the Bahraini population, the above value (> 28) has been selected to indicate the cases of obesity in this study's sample groups, because of the similarity of the samples between the Bahraini research and The Allied Dunbar National Fitness Survey.

The Metropolitan height-weight tables (1959 and 1983) are often used to indicate overweight and obesity. These tables provide a standard or an ideal weight for a given height; there are separate tables for men and women. It should be noted that these tables have been criticised heavily (see Chapter II), and are not recommended for use for weight reduction advice. This is to prevent possible misjudgement of whether the individual is above standard of weight or fat, since advising a person who is overweight but not overfat to lose weight may be hazardous to health. However, the Metropolitan tables have been used to evaluate the extent of overweight of this study's sample groups.

From the above, it should be recognised that obesity and overweight are not the same, although they have been used interchangeably in some research. Obesity refers to an excess in body fat, while overweight is a condition when body weight is over certain standards (e.g. ideal weight). According to the Metropolitan height weight table (1959), on average the younger Bahraini women were 8.6 kg above the desirable weight for their height; and the older Bahraini women were about 20 kg above the ideal weight for their height. In

terms of obesity, both groups were defined as obese, since their mean percentage body fat exceeded 30% (29 older women and 26 younger women had a percentage body fat over 30%), which suggested that the Bahraini groups studied were obese (according to obesity norms identified in the literature). However when considering their mean BMI values, it appears that only the older women were obese (18 women were > 28 BMI), while the BMI mean value was 24.8 $kg.m^2$ for the younger group. Similar patterns are reported in the Allied Dunbar National Fitness Survey (1992), which could be due to the fact that, whilst BMI is correlated strongly with body fat measures, it should not be used to quantify fatness within the body. This index can not indicate whether an individual is obese in terms of excessive body fat or overweight in terms of excessive body muscles (discussed earlier). Although BMI is used widely in clinical and in large population surveys, several investigators have criticised its use to indicate obesity in individuals (Keys & Brozek 1953; Brodie 1988).

As mentioned earlier, no attempt was made in this study to recruit obese or overweight subjects, so the finding of the prevalence of obesity and overweightness among the younger and the older Bahraini women could be used to support the prediction of Musaiger (1990) that obesity is increasing among adult women in Bahrain.

Despite the existence of obesity and overweightness among the two groups of women, whether they were aware of it is another factor. It appeared that the majority of the women lacked knowledge about being obese, although they indicated that they considered themselves overweight. The younger women believed that they were 9.7 kg overweight, while the older women thought that they had an average 12.7 kg extra weight. Being able to distinguish between overweight and obesity is not only uncommon among ordinary people; according to Wilmore and Costill (1994) scientists are still confused between the two terms. This kind of uncertainty may lead overweight but not fat people to diet, which could dangerously reduce their body fat level.

Both groups perceived their current weight quite accurately, but the younger women were more precise. This could be due to the recent emphasis on women's body weight in the media. Twenty to thirty years ago, in Bahrain, weighing the body was a procedure only carried out in hospitals for health screening, and weighing scales were not available in every household as they are now. Many young women today weigh themselves daily to monitor any changes in body weight. Like Western women, Bahraini women are concerned about their body weight.

Obesity is caused by either overeating and/or lack of activity, producing a positive energy balance, and therefore a gain in body weight and fat. McArdle et al (1994) suggest that obesity is a result of inactivity more than overeating. The Bahraini women's lifestyles reported in Table 3, indicated that at the time of the study, the majority were not engaged in any physical activity programmes, which suggests that they were inactive. In general, Bahraini women (older and younger) have a sedentary lifestyle, and most are dependent on housemaids to do their house work. Half of the older women and about one third of the younger women owned cars and used them every day. Women's leisure time in Bahrain is spent in watching TV, or in visiting friends and relatives, with time spent chatting and eating snacks (Musaiger & Al.Ansari 1992). All these factors seem to reduce women's energy expenditure and increase their energy intake, which would maximise their chances to be obese. However, some of the women reported that they were exercising and dieting for weight reduction and weight maintenance reasons, which indicates that they were aware of their obesity problems and trying to overcome them. The Ministry of Health in Bahrain is beginning to adopt educational intervention, through personal contact or through the national media, aiming to increase public awareness of the risk factors associated with obesity, and to encourage people to adopt a more active lifestyle. Nowadays, more women in Bahrain, especially younger women, have shown an interest in exercise and have begun to participate in either organised programmes (Governmental or private), or individualised programmes (more women are seen walking and running).

Another factor contributing to obesity is overeating, which alone or accompanied by inactivity, produces a positive energy balance. One sign of social and economical changes in Bahrain is the shift in the Bahraini diet from traditional (fish, vegetable, dates, bread) to a higher energy diet (red meat, chicken, egg, milk, sugar) (Musaiger 1990). Recently, more Western fast food restaurants appeared in Bahrain, which could add even more calories, and which thus could increase the incidence of obesity in Bahrain. However, it was not possible within the scope of this study to provide nutritional data for the sample groups. The higher rate of obesity among the older subjects could also be due to multiple pregnancy; 80% of the older women had between 2 and 12 children, compared to the younger women, 26.7% of whom had between 1 and 2 children (Table 2).

Socio-economic status is another factor associated with obesity, with educational status and income the most widely used indicators to measure socio-economic status (Flegal et al 1988). Investigators report that socio-economic status correlates negatively with obesity in Western and American women, whereas it correlated positively in women from developing nations (Sobal & Stunkard 1989). These differences in the directions of association between obesity and socio-economic status show that in developed societies, thinness is more prevalent among women with higher socio-economic status, while obesity is more prevalent among women with higher socio-economic status in developing countries. In the present study, there were no significant associations between educational status of the older and younger women and their BMI and percentage body fat. However, there were indications of a trend towards a negative association between obesity and educational status (see Table 33, Appendix IV). This indicates that like Western women, Bahraini women with a lower level of education had higher values of BMI and percentage body fat. Musaiger and Al.Ansari (1992) also found that obesity is more prevalent in Bahraini women with lower levels of education than in women with higher levels of education. Women with higher education in Bahrain are more likely to be employed, perhaps occupying better job positions than less educated women. Most women in administrative positions in Bahrain are highly educated. Working and educated women in Bahrain

are more exposed to society, and are more aware of their appearance. Furthermore, they could be argued to be more affected by Western values through their frequent journeys to the West.

Obesity is considered a primary risk factor for numerous life threatening diseases such as hypertension, diabetes, cardiovascular diseases, and some forms of cancer. Musaiger (1990) indicated that these diseases are the major public health problems in Bahrain, and according to the latest census 1991, the highest rate of death among the Bahrainis was caused by cardiovascular diseases.

Obesity is not only associated with somatic health problems. Psychological consequences such as negative feelings towards the body and self are also factors. In this research the psychological measures considered were body cathexis, silhouette choices, physical self perception, and self-esteem. The findings showed that as the younger and older women's body measurements (weight, waist girth, suprailiac skinfold, abdomen skinfold, abdomen girth, subscapular skinfold) increased, their ratings of the corresponding items in the Body Cathexis Scale moved towards dissatisfaction (see Table 9). Overall, the fatter the women were, the lower their body cathexis scores. These findings support those of Langston (1979), Jourard and Secord (1955), and Brodie and Slade (1988).

The findings also indicate no significant differences between the way the younger and older women cathected their body parts and functions: both were least satisfied with their body weight and waist and most satisfied with their voice, ears, keenness of senses, and age (refer to Table 8). Other studies also reported that age did not affect individuals' satisfaction or dissatisfaction with their bodies (Davis & Cowles 1991; Lai 1984; and Theodorakis et al 1991). Nevertheless, the older women scored significantly lower than the younger women in aspects related to health and well-being such as knees, resistance to illness, and age. It seems that the older group are more health aware, which may be linked to ageing process and accompanying bodily changes (discussed earlier), menopausal problems (not

considered in this research), and their obesity status which was established in this research.

The literature showed how desire for thinness affects Western women's lives, and that if their figures do not match that thin "ideal", they become more dissatisfied with their bodies. This desire for thinness is well established for young women (Fallon & Rozin 1985), as well as for older individuals (Plutchik et al 1973; Hallinan & Schuler 1993). It is also suggested that being obese in these societies (the West) means living in fear of being stigmatised and despised by other people, and being treated as having a physical, mental and emotional disability (Wooley & Wooley 1985). In non-Western societies, where plumpness and overweight are claimed to be admirable and may be acceptable, these kind of attitudes towards obesity might not exist. However, there is no reported research in this area.

Self-esteem is another psychological variable considered in this research, in which the women's global self-esteem and physical self perception were measured by two different instruments: the Adult form of Self-esteem Inventories (SEI), Coopersmith (1991) for the global self-esteem, and Physical Self Perception Profile (PSPP), Fox 1990 for the physical self-esteem. The former was used to measure the unidimensional aspect of self-esteem, and the latter to measure the hierarchical aspect of the concept. Shavelson et al (1976), proposed a hierarchical structure for self-concept (or self-esteem as used by Fox, 1987; 1990), in which global self-esteem is situated at the apex level, the more specific dimensions of self-esteem (e.g. physical, social, emotional, and academic) are located at a lower level, which is also divided into more specific features (physical appearance, physical ability). At the base of this hierarchy, very specific aspects of self-esteem are located. Shavelson et al (1976) found that global self-esteem is a stable construct, but that specific aspects of self-esteem located at the base of the hierarchy could be changeable. The physical self-esteem of the subjects was measured by the newly developed Physical Self Perception Profile (PSPP) (Fox 1987). The writer considered a hierarchical model for self-esteem, with global self-esteem at the apex, physical self worth (PSW), representing the

physical side of the general self-esteem, at the domain level, and the following four scales (sport competence, physical condition, body attractiveness, and physical strength) at the sub-domain level (Figure 9). Hence, according to Shavelson's hierarchical model, the PSW situated at domain level and the four scales situated at subdomain level might be expected to change as they are more situation-specific.

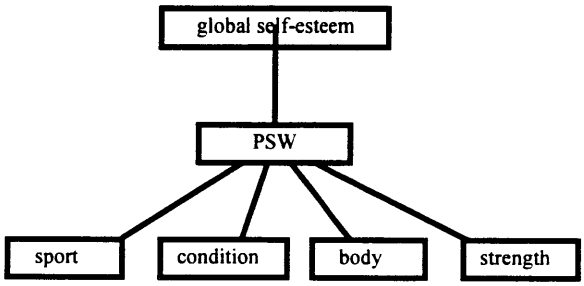


Figure 9: Hierarchical structure of PSPP and its relation to global self-esteem

The data from the younger Bahraini women are in line with Shavelson's argument; global self-esteem was not correlated with any of the body composition variables (Table 18) - that is being fat or thin did not affect the women's self-esteem. The global self-esteem of this group was found to associate significantly with their physical self worth (PSW), and their PSW correlated negatively and significantly with largeness in their body measurements (body mass, BMI), and positively and significantly with height (Table 18). It could be said that the younger women did not score high on physical self worth (PSW) when they were heavier, shorter, and larger in body girth. This feeling could have indirectly affected their global self-esteem. At the lower end of Fox's hierarchical model, the younger group's height was the body measure found to influence positively the women's feelings towards their sport competence, body attractiveness, and physical condition. Tallness among this group may be viewed as a requirement for a sporting individual, as the image of female athletes (Western) in the media is that they are tall. The fourth subdomain (strength) was found to correlate positively with all the body composition measurements (except for height).

This is also reported by Fox (1990), who argued that some people relate body size to strength.

The data from the older Bahraini women show a different direction. They reported a higher global self-esteem than the younger group (Table 17), as also reported by Coopersmith (1991). The older women expressed higher self-esteem when their fat free mass value was larger; global self-esteem was found to correlate positively and significantly with fat free mass in the older group (Table 19). Similar correlations were found between global self-esteem and other variables from the Body Cathexis Scale such as hair, hand, eyes, and resistance to illness in the older women (see Table 34, Appendix IV). This could support the previous discussion that the older women were more concerned with their health than with beauty. Unlike the younger women's data, this group's global self-esteem was not related to their PSW, and their PSW was not related significantly with their body measurements. On the other hand, the body attractiveness subdomain was found to correlate negatively and significantly with most of the body composition measurements (Table 19). The older women felt less physically attractive when their body measurements were heavier and larger. The strength subdomain in this group did not correlate significantly with body measurements as in the younger group.

For the older women, PSW, physical condition, and physical strength correlated significantly with the women's feelings towards their body parts and functions and their physical fitness (Table 35, Appendix IV). For example, the strength subdomain of the PSPP correlated significantly with the muscular strength item of the Body Cathexis Scale (BCS), and the physical condition subdomain correlated significantly with the physical skill and physical stamina items of the BCS. These kinds of correlation may lend support to the relevance of the PSPP's domain and the two subdomains (strength and condition) for this group of women.

To summarise, global self-esteem to the younger women may be related indirectly with their physical appearance, while it may relate to health, well being and physical fitness for the older women.

The data on the younger and older women's global and physical self-esteem partly supported Fox's hierarchical structure. Figure 10 and Table 18, demonstrate how the younger Bahraini women perceived their physical self and how this related to their global self-esteem. In this group, global self-esteem is only related to the PSW (the domain or the second level of the hierarchy). The PSW correlated significantly with body attractiveness and physical condition (sub-domain level); both related positively with each other. From physical condition, lower layers have emerged, i.e. sport in the fourth level and strength in the fifth level. For the older group (Figure 11, and Table 19), there was no evidence of global self-esteem in the hierarchy model. As with the younger women, this group's PSW correlated significantly with body attractiveness and physical condition, with both correlated with sport competence. Fox (1987; 1990), found significant correlations between global self-esteem and PSW, and between PSW and sport competence, body attractiveness, physical condition, and physical strength.

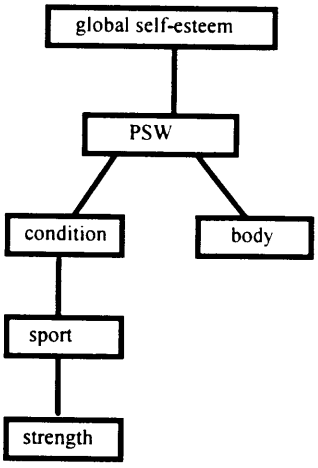


Figure 10: The structure of self-esteem and PSPP among the younger Bahraini women.

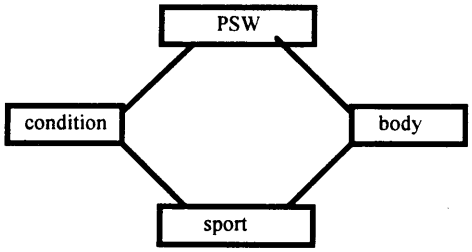


Figure 11: The structure of self-esteem and PSPP among the older Bahraini women.

It seems that for the older Bahraini group there is a missing link between the global self-esteem and the PSW, which could be represented by health and well being, since health aspects of the Body Cathexis Scale were found to correlate significantly with both global self-esteem and PSW. Physical condition, physical strength, and sport competence may be conceived differently among different cultures and age group cohorts. For example, the term physical condition is known by the Bahraini inactive women as a general term for physical fitness, so they might perceive it as representative of the other two subscales. It should be noted that PSPP was designed to measure the psychological aspects associated with exercise involvement. Since the sample groups of this study were sedentary, their perception of sport and exercise may differ than the sporting population studied by Fox (1987). However, the mean scores of the younger Bahraini sample were slightly higher than that reported in Fox (1990).

The women in this study (both older and younger) were dissatisfied with their body mass and wanted to be lighter. The younger women idealised a body mass which was on average 6.7 kg lower than their current mass, and the older women idealised a body mass which was on average 11.6 kg lower. Information regarding weight loss methods, body weight, and other concerns regarding body size are probably passed to Bahraini women through Western magazines (e.g. Vogue, Cosmopolitan). Unfortunately this kind of data is not readily available, although Musaiger and Al.Ansari (1992) found that most of

the women in their study reported that books and magazines were their sources in obtaining nutritional information. Musaiger et al (1991) showed that Bahraini adolescent girls and boys relied on TV, books, magazines, and newspapers to get their information about nutrition and obesity. Thus it is likely that TV, magazines and books are used by younger and older women to get information about body mass and ideal body shape for women. The Western media, available in Bahrain, send messages that the tall thin female figure, or the petite thin sexy looking female body, such as the figure of the American movie star Pamela Anderson, can be easily obtained. The methods which imply a promise of achieving this ideal, such as variety of diets and slimming devices (built, suits, diet foods etc.) are also available from the same sources. In this study, some of the younger and older women indicated that they were dieting, exercising, and using drugs to lose weight.

In North America and the West the issue of the ideal female figure and its related consequences (the prevalence of eating disorder diseases among women, dissatisfaction with body shape, psychological disorders, and the prevalence of obesity) are recognised and have been studied, and people are beginning to be informed about these consequences. The situation in Bahrain and the other neighbouring countries may be worse, since which the so called Western ideal female figure is well known by women there, but the associated problems are not.

The findings of this study indicate that like Western women, the younger and older Bahraini women were conscious about their figures, and thinness seems to be the body shape admired by the Bahraini women. This supports data reported for Western women (Fallon & Rozin 1985; Hallinan et al 1991; Rozin & Fallon 1988; and Lamb et al 1993) and for Arab female students (Ford et al 1990). These studies reported that women were dissatisfied with their body shapes, with their ideal female figure much thinner than their current figures. While this was also found in the present study, the ideal female figure desired by the Bahraini women appears to be even thinner than that desired by the Western women in the above studies. This contradicts the claim that the desire for thinness is less pronounced in non-Western

societies, because of social appreciation of plumpness in females (Furnham & Alibhai 1983). However there is little real information from many of the non western societies, especially Arabian Gulf countries. It should be noted that these societies have been through tremendous social and economic changes which resulted from oil revenue, education, and Western influences. It is more likely that Western women's preoccupation with the thin female figure is passed on to women in other countries (Furnham & Alibhai 1983; Nasser 1988). It is also possible that Bahraini women, in an attempt to emulate Western ideals, show extreme ideals of thinner female figure.

The findings of this study showed that the Bahraini older women desired an even thinner body than that desired by their younger counterparts, or that reported for older and younger Western women (Rozin and Fallon 1988, and Lamb et al 1993). The studies in this area appear to be contradictory, since some imply that women seem to be more satisfied with their bodies as they age (Rackley et al 1988), while others indicated the opposite (Plutchik et al 1973; Davis & Cowles 1991). With the recent trend towards thinness and its favourable characteristics (elegance, beauty, and youth), and unfavourable characteristics assigned to obesity such as laziness; self-indulgence; and old age, it is not surprising that older women would seek a youthful looking thin body.

Another issue worth considering which could explain the preference of the older Bahraini women for a thinner figure, is the awareness of the consequences of obesity such as hypertension, diabetes millitus, heart diseases (discussed earlier). Some of the younger and older women indicated that they were not happy with their upper abdominal region and wanted to change it. The younger group indicated that this change was needed for personal and beauty reasons, while the older group indicated that, in addition to these reasons, they need to change for health related reasons (refer to Chapter IV).

Bahraini men's attitudes towards their wives' bodies seem to be partly responsible for this preference for thinness among Bahraini sample groups. The husbands of the older and the younger women indicated that they were dissatisfied with their wives' bodies, as shown from their preference to a much thinner female figure than the current figures of their wives'. Moreover, the younger husbands perceived their wives' current shape to be fatter than the wives believed they were, and idealised a thinner figure than that idealised by their wives (Table 14). On the other hand, although the older husbands indicated that they were dissatisfied with their wives' bodies as they prefer a thinner female body, their preference was not as extreme as their wives' were. Whether men's ideal female figure has changed from the past or remained the same is not known, since there is no such information available in the literature. However, this study revealed that the ideal of the younger men is thinner than that of older generations. These findings are in agreement with Western studies (Lamb et al 1993).

The data obtained from an independent sample of Bahraini men (not related to the women sample groups) confirmed that thinness is the ideal female figure for Bahraini men (Table 16).

Not only were silhouette female figures used to get information about men's preferences in female figures, but also questions about their wives' and their ideal female body measurements. Both groups of husbands indicated that they prefer a taller and a lighter woman than their wives' measurements. The younger husbands desired a female body weight which is lighter than their wives' body weight by 8.81 kg, and a female height which is taller than their wives' by 4.7 cm. The older women's husbands prefer their wives to be 12.5 kg lighter and 3.9 cm taller than their current weight and height. Since the majority of the younger and the older women indicated that they felt overweight, they were asked who gave them such an idea. The majority of them reported that this idea came from themselves, with only very few indicating that their husbands were responsible.

Unfortunately, there is no solid evidence to show what female figure was ideal among Bahrainis, in the past. However, this research showed that during the Sixties, the majority of the older women had admired a thin female figure with a body weight of about 54 kg (Table 5). During that period, Bahraini women were being introduced to the Western ideal (through the media and/or by foreigners living and working in Bahrain). This attachment of the Bahraini women to Western ideas and values appears to be part of the social and economic reforms which took place in Bahrain during that time. Western women were seen by the Middle Eastern women as well educated; having freedom, independence, and having gained their rights and equality with their male counterparts (Ata 1984). Thus, it is not surprising that western women are regarded as models by Middle Eastern women. Ata (1984) stated that Westernization affected Middle Eastern women differently, in which countries like Lebanon and Egypt were most influenced by the Western world (e.g. Lebanese girls not only wore western clothes, but also copy the western morals and values like going to movies on Saturday nights with boyfriends).

In Middle East countries, western fashions appear to symbolise issues other than modernisation, including educational status, employment, and class status. Upper class women were the first to change from their traditional dress to Western style fashion, as they were able to afford travelling and buying Western goods. Similarly, educated and employed women were recognised by the Western style of their clothes. Thus, wearing Western clothes would give the impression that a person is well educated and/or from the upper class rank (Ata 1984).

Another factor influencing Bahraini women's ideals of a thin female figure is the preference of Bahraini men for a thinner female figure. Like Bahraini women, Bahrain Muslim men are exposed to the Western media, in which the "thin" ideal female figure is well portrayed. The findings of this research indicated that the men's level of education was associated with the female figure they chose to represent their ideal, in which the higher the level of education, the more likely the preference for a thinner female figure (see

Table 36, Appendix IV). It is suggested that Middle Eastern people with higher education prefer to watch Western movies and programmes (Ata 1984), and that those with a higher level of education were more likely to have been educated abroad (e.g. in the West). Therefore, this preference for a Western ideal female figure among the three Bahraini male groups studied could reflect the great influence of Western ideas upon Bahrainis. It is also plausible to suggest that the current status of the Bahraini women's bodies was not appreciated by their husbands, who prefer a thinner figure, which may put pressure on women to lose weight by commercialised methods available from the West. This kind of pressure is believed to be responsible, in part, for the prevalence of eating disorder diseases among women in the West (Fallon & Rozin 1985). It is unfortunate that the presence of such diseases (i.e. anorexia nervosa and bulimia) in Bahrain has not yet been studied and reported. However, with all these signs (dissatisfaction with the body and the preference of thinness among Bahraini women) which have been recognised in the West as indicators of eating disorder diseases, one can speculate that it could also be the case in Bahrain. Therefore, immediate research to study such phenomena in Bahrain is needed.

In summary, this part of research implies that while Bahraini younger and older women pursue a very thin "ideal" female figure, the prevalence of obesity among them is very high. Not only were the women not satisfied with their figures, but their husbands also prefer a thinner female figure. On the one hand, societal pressure upon Bahraini women is increasing, especially if they are highly educated and working full time outside the home. On the other hand, traditional restrictions and religious values pressure them not to forget their indigenous ideal and morals. In addition, Western ideas, values and models challenge them to be like Western women. Thus, in an attempt to satisfy all these pressures, the women seem to be in an alarming situation: obese and not happy with their bodies, and desiring a very thin figure which is impossible to attain. There appears to be an urgent need for an educational programme, to lay out these issues and their consequences, and also a remedial programme, which would help them to combat obesity and their associated psychological problems.

PHASE II:

PRE EXERCISE CONDITION:

The initial body status of this group, like the other two groups studied earlier, was obese, as indicated from their mean percentage body fat (40.7%), and their BMI mean value (30.6 $kg.m^2$); and overweight, according to the 1959, and the 1983 Metropolitan height-weight tables. Body fat (percentage) was found to be higher among the older Bahraini women (see Table 37, Appendix IV), in agreement with the previous discussion. Educational status was the only socio-economic indicator which correlated negatively and significantly with body mass ($r = - 0.46$, $P < 0.05$). This implies that the higher the level of education of women in this group, the less likely they were to be overweight. Educated women are more likely to be aware of the health consequences of overweight, and probably, they are more attached to Western ideas and values, where overweightness is not appreciated. Additionally, since education and occupation status of the group correlated significantly ($r = 0.77$, $P < 0.001$), it is possible that they were also concerned about their physical appearance. Working and educated women might be expected to appear, for example well-dressed, elegant, and probably Western like. In addition working outside their houses make their bodies noticeable by others. Thus, there may be more social pressure towards concern about their bodies and their appearance.

The majority of this group were aware of their condition (obese and overweight); they believed that they carried about 16 kg extra weight. These women seemed to be displeased with their extra weight; they stated that they wanted their body mass to be about 17.7 kg lighter than their present body mass. Dissatisfaction with their bodies was also apparent from their evaluations of their feelings towards their body parts and functions (Table 27, body cathexis data), in which they felt least satisfied with their weight, waist, hips, legs, knees, breast, back, body build, appetite, chest, muscle tone, energy level, and flexibility. This is in agreement with what was reported in other studies (Jourard & Secord 1955; Theodorakis et al 1991). According to

Jourard and Secord (1955), women are more familiar with these particular body parts for cultural reasons; such as buying clothes. The women in this study indicated that they felt that their hips, lower and upper parts of their abdomen, waist, and thighs were too fat (refer to page 170). They indicated that, if they had to change these body parts, it would be for personal satisfaction, finding fitting clothes, social desirability, satisfying their husbands and health and fitness reasons. Such reasons may reflect how various factors e.g. social, personal, health, beauty, and men interact to influence women's bodies. It is very well documented that every society has its own ideal image of women's bodies (Ford et al 1990), supported by the media, and other advertisements for clothes, domestics, health, exercise, diet and other related industries. Hence, to reinforce this so-called "ideal", any other body types (e.g. overweight, obese) would be disliked and rejected. Kisslings (1991) implied that fat women in the USA are discriminated against i.e. better opportunities are given to thin women in jobs, university entrance etc. This could be the case in other societies where thinness is desirable. Consequently, there is pressure for women towards the thin ideal, and the danger of psychological and physical impairments e.g. self-hatred, self-denial, body dissatisfaction, eating disorder diseases might be expected.

The Bahraini women showed that they were not happy with their body shape; their ideal female figure was significantly thinner than their current figures. In fact they idealised a very thin figure, which could be difficult to achieve. It should be noted that clothes had no effect on their perceptions of their current and their ideal female figure. They idealised a thin figure whether it was nude; or dressed in Western or Islamic clothes. As discussed in the previous phase, several factors could be responsible for this difference between the current and the ideal figure. This group showed that, like Western women, they idealised a thinner figure. Another factor which might influence the women to be unhappy with their bodies, is men's attitudes towards women's bodies. The husbands of the married women in this study showed dissatisfaction with their wives' bodies, stating that they wanted their wives to be about 15 kg lighter and about 5.5 cm taller. Their ideal female figure was thinner than how they perceived their wives' current figures.

However, unlike the younger Bahraini men in the previous phase, this group's husbands' ideal female figure was slightly fatter than that idealised by their wives.

Negative and significant correlations were found between the variables of self-esteem (the women's global self-esteem, and two components of their Physical Self Perception Profile: body attractiveness and physical condition) and some of their skinfold and girth measurements (refer to Table 38, appendix IV). This may indicate that the larger the women were, the less physically attractive, physically conditioned, and self-worth they felt.

The pre exercise programme physical fitness scores of the Bahraini women, when compared to the norms provided by the YMCA (Golding et al 1989) for the age group 26 to 35 (the mean age of the Bahraini sample was 31.1 years), indicated that they were in poor or below average condition. These norms are based on data from American women, because no such norms for Bahraini women were available.

To summarise: before initiating the exercise programme, the 25 Bahraini women volunteering to take part in this phase were obese, overweight, physically unfit, and not happy with their body shapes and measurements. Their physical condition negatively affected their global and some components of their physical self-esteem.

EXERCISE EFFECTS:

The exercise programme utilised in this study was based on scientific considerations recommended by the American College of Sports Medicine (1991), although cultural, traditional, religious, availability of facilities, the researcher's experience in this field, and the physical characteristics of the sample were taken into account (see chapter III). The programme lasted for 3 months, three days per week, for 60 minutes a session. The main objective in this programme was to engage the women in and sustain the programme, minimising drop out. Bahraini women, especially older women, conceived exercise as "not for them", e.g. difficult, intolerable. They were encouraged to realise that exercise is not complicated and painful, it simply can be done by

anyone. Similarly, the method of monitoring the intensity of the programme was chosen to avoid drop out. Various methods are used to monitor the intensity of the aerobic section of an exercise programme, e.g. exercising heart rate, Vo_2 max, energy cost of activities, metabolic equivalent (METs), but they do not seem to be applicable when used with sedentary Bahraini women who did not manage to count their exercising heart rates. Thus, it was decided to use a simpler method of intensity monitoring, that is recording the distance the women walked or jogged in a given time (i.e. 15 minutes), which was simple to do, since they were using a 400 m out- door athletic track. Although the programme took place in the evenings of the hottest and the most humid months in Bahrain (July to October), the rate of adherence was better than expected (68%), and rather better than others which have been reported as less than 50% (Ready et al 1991; Robertson & Mutrie 1989). During the first six weeks of this study's programme, there was no sign of any drop out; it only started after the mid-exercise measurements. By the mid-exercise measurements, the signs of improvement in most of the physical, physiological, and psychological measures had appeared (although some were not statistically significant). Thus for those who find it difficult to sustain longer programmes, a programme of six week can be useful. It may be that such a programme could be considered a basic guideline for them to continue in their own pace and time.

The three month programme offered in this phase was affective in achieving alterations in the physical, physiological, and some of the psychological variables studied in this phase. By the end of the programme, the women lost on average about 3 kg body mass, 1% body fat, 2.1 kg fat mass, and 0.9 kg fat free mass (FFM). Both body fat and FFM contributed to the 3 kg reduction in body mass. The mechanism of exercise-induced changes in body composition includes a reduction in body fat, no change or a slight increase in FFM, and no change in body mass. However, this mechanism did not work every time; several studies reported only a reduction in body fat (McCord et al 1989; Schaberg-Lorei et al 1990). In the present study, most of the skinfold and girth measurements decreased significantly from the pre

and to post exercise programme, except that of the calf girth which increased significantly (refer to Table 24). Since the programme was based on walking and jogging, it is not surprising that the muscles in the calf area is increased in size.

The finding that the FFM of the women decreased during the first six weeks of the programme needs an explanation, especially in the light of scientific knowledge that losing lean tissue can result in a decline in the resting metabolic rate (Tremblay et al 1985, and Brehm 1993). Tremblay et al (1985) noted that resting metabolic rate is found to be high in people with large muscle mass, e.g. athletes. A decline in FFM was also reported in other studies, Ward et al (1984) noted that exercise resulted in a loss in body weight, body fat, and LBM. Forbes (1992) concluded that changes in LBM are related to changes in body weight: a reduction in body weight is accompanied by a reduction in LBM, while maintenance of body weight accompanied an increase or a preservation in LBM. This was observed even if dietary intake was not changed from pre-exercise. Forbes (1992) advised those who would like to maintain or increase their LBM, to increase their caloric intake, that is to compensate for the caloric expended through exercise, so that they would lose fat mass but not weight or LBM. This issue is worth more consideration and needs further research.

A deeper look at the FFM change in this study might be useful in explaining where the deficiency was. The present study showed, on the one hand a similar direction of changes, that is a reduction in body mass, fat mass, and FFM, in which all these variables were significantly and positively correlated. Thus the reduction found in the body mass was a result of the reduction in both of its components (fat mass and FFM). On the other hand, this reduction in FFM was only evident during the first six weeks of the programme, after which FFM was maintained. Thus, it could be said that this programme started to affect the women's FFM after the sixth week. In terms of exercise effects on FFM, it appears that for this group of Bahraini women, more time was needed to adapt to exercise programme. The reduction in FFM of the women during the first six weeks might have resulted from several factors, some related to the programme, others not. such as factors which are difficult

to control such as food intake, daily life style, and some sorts of diet programmes, which could delay improvement in FFM. On the other hand, the muscular strength exercises offered in this programme might not be effective until the second half of the study. The American College of Sport Medicine (1991) recommended inclusion of weight training exercises in any programme to preserve or increase the muscle mass. It is also possible that since this group were initially sedentary, they might require more time for their muscles to adapt to the programme. It is therefore not reasonable to conclude that this programme was not effective in improving the Bahraini women's FFM.

Another issue worth considering is the small scale of changes in body composition found in this study, in agreement with what was reported in the literature (Lohman 1984; Wilmore 1983). This issue may make people wonder if it is worth all the efforts to lose only a small amount of body mass and fat. This kind of misleading information can be passed easily to women and will discourage them from participating in exercise programmes. Researchers emphasise that any programme oriented towards producing changes in body composition should pay attention to health and safety (Wilmore & Costill 1994; and McArdle et al 1994), that is to lose mass and fat gradually, and to avoid losing more than 1 kg of body mass per week. The current study showed that the amount of mass and fat lost was as recommended; gradual and not great. It is reasonable to speculate that if participants continued their exercise regime, this gradual loss of body fat and probably body mass would continue. Furthermore, every single skinfold and girth site, measured in this study, reduced gradually and significantly. Thus, not only did the women become lighter and thinner, but also their body shape changed.

In addition to positive improvement in body composition, the women improved significantly in their fitness test scores, except that in upper body endurance. There is no shortage of research showing improvements in physical fitness parameters associated with exercise (Bergman & Boyungs 1991; Hardman et al 1992; McCord et al 1989). Among the present subjects,

changes in Vo_2 max were related negatively (but not significantly) with changes in percentage body fat ($r = - 0.39$, $P = 0.05$). This could imply that those who lost more body fat were also shown to improve their maximal oxygen consumption. This improvement in cardiorespiratory function of the women may suggest that the level of intensity, duration, and frequency applied in this programme were suitable for sedentary, overweight and obese women living in a hot and a humid climate. The great improvement in the muscular endurance fitness indicates that the type and the amount of exercises used for the abdominal region was sufficient to produce sustained changes in those muscles. It should be noted that the greatest loss of subcutaneous fat was from the abdominal region (Table 24). This could be due to the characteristics of adipose tissues in the abdominal area, which is believed to be more active metabolically than those in the thigh and buttocks areas (Bjorntorp 1983); and/or to the higher level of growth hormone which increases with exercise, and according to Wilmore and Costill (1994), is responsible for fat mobilisation in the abdominal region. Furthermore, the static and dynamic stretching exercises were useful in enhancing the flexibility dimension of physical fitness. On the other hand, muscular strength showed a small but not significant improvement, which may suggest that for this group, probably there was a need to include more strength exercises, or some sort of weight training exercises.

The psychological parameters considered in this study were affected by exercise, but differently from the physical and physiological parameters. This is understandable, since physical and physiological measures are directly functional and factual, whereas the psychological measures are indirect and dependent on the women's ratings and evaluation. In this study, those psychological variables which are related to the women's bodies showed a significant improvement, while those relating to general terms (i.e. self-esteem) did not change significantly.

The programme was effective in changing the women's perceptions of their own figures (became thinner), and their ideal female figure (became fatter) (refer to Figure 8). Prior to the programme, the women showed a wider gap between their perceptions of their own figures and their ideal female figure

than after the programme (the gap became narrower). This could indicate that they became more realistic towards fatter and probably attainable figures than they were before the programme. Improvement in the women's perceptions of their own bodies correlated significantly and positively with improvements in most of the body composition measurements, hips girth, BMI, mass, fat mass, biceps girth, thigh girth, neck girth, percentage body fat, thigh skinfold, abdominal skinfold, triceps skinfold, FFM, bust girth (Table 39, Appendix IV). It is possible that the women's awareness of the changes in their body composition positively affected their perception of their figures. This programme appeared to influence, indirectly, the husbands' perceptions of their wives' bodies (refer to Chapter IV). The changes in the wives' body composition measurements were perceived and noticed by their husbands. The husbands also showed a tendency to idealise a fatter female figure. These improvements in the husbands' attitudes towards their wives' bodies could also have influenced the wives' attitudes towards their bodies and their ideal, adding more indirect psychological benefits of this programme. It is plausible to suggest that the exercise induced reduction in most of the body composition measurements influenced the women's perceptions of their figures as thinner, and more reasonable in assigning an ideal female figure. The indirect effect of this programme was evident in the husbands' perceptions of their wives' bodies, which showed increased satisfaction.

The other psychological benefit was the significant improvement of the women's perceptions of their body attractiveness (Table 26). With the exception of the physical condition subdomain, all of the other Physical Self Perception Profile's (PSPP) dimensions (sport competence, physical self worth, and physical strength), showed a tendency to improve, although not significantly. It should be noted that, although the women in this study were sedentary, they scored higher in the PSPP's items than the active women studied by Fox (1987; 1990). Thus it could be speculated that due to the high pre exercise scores, no room was available for more improvement. It is also possible that the women were not interested other than in the body item of this scale, where improvement was significantly evident.

There were no significant improvements in the more general constructs such as the global self-esteem and the total body cathexis scores of the Bahraini women. However, there were significant changes in some items of the Body Cathexis Scale, namely satisfaction with weight, waist, and profile. Some studies reported no changes in body cathexis and self-esteem with exercise (Joesting & Clance 1979; Caruso & Gill 1992), while others showed that body cathexis improved with exercise (Chwast 1978; Joesting 1981; Salusso-Deonier & Schwarzkopf 1991).

Researches indicated that people with low fitness scores show more improvement than people with high fitness scores (Eickhoff et al 1983). In the present study, this suggestion was taken into account, in that the women were divided into low fitness group and high fitness group, in accordance to their pre-exercise Vo_2 max scores. A two way ANOVA for repeated measure (groups x time) was conducted and indicated no differences between the groups over time (pre, mid, and post measurements) in their global self-esteem, total body cathexis, and the items of the PSPP (sport, condition, strength, and physical self-worth). Therefore this study provides no support to the assumption that fitness level influence self-esteem changes with exercise.

The hierarchical organisation of global self-esteem, proposed by Shavelson et al (1976) indicates that this construct is resistant to change, because it involves different aspects and experiences of one's life, e.g. social, emotional, academic, physical. Each of these aspects also involves more specific areas. This kind of division into more specific levels continues to the base of the hierarchy, where very situation-specific experiences are located. Thus both the global self esteem, and total body cathexis were expected to be stable in this research. The more specific aspects related to the body (items of body cathexis, perception of body attractiveness, perception of one's figure) did improve significantly.

Other psychological and social aspects are worth noting. It is important to understand that persuading Bahraini women to take part in exercise is in itself

an achievement. Like any women, most Bahraini women are very much devoted to their families, and entertaining and caring about themselves might be considered as wasted time better spent with their families. Although the importance of exercise is well disseminated among the Bahrainis, still most of them consider exercise as not acceptable for women. In other words, most of Bahrainis might believe that exercise is important for women, but going out to exercise is not acceptable, and it might be preferable to exercise at home (many women own exercise machines, e.g. bicycle ergometry, treadmill, rowing machines, steps, and Western work out video tapes). It should be noted that these machines and tapes are used without professional guidance, and there is a need to initiate an educational programme on the consequences of misusing these machines. Such a programme should be oriented to correct people's conceptions about sport and exercise. Fads and misconceptions are widespread in Bahrain, for example spot reduction: most of the Bahraini women enquired about abdominal exercises, and to the researcher's knowledge, women mostly perform sit ups exercises for the sake of getting a flat stomach.

The programme used in this study was safe and appeared to suite the Bahraini women; there was no incidence of injury. In addition, feelings of relaxation and happiness were observed and indicated by some of the group members. For some, this programme was the only way of socialisation and meeting friends, and in fact friendships were developed among the women.

SUMMARY:

PHASE I:

This phase was designed to investigate body image, body composition, and self-esteem of Bahraini women, their relationships and the social influences upon them. The sample groups were 30 younger Bahraini women (20-25 years), and 30 older Bahraini women (50-55 years). The majority of the two groups were highly educated and employed women. Half of the younger group and 76.7% of the older group were married.

The data collected in this phase included: body composition, body image (body cathexis, perception of current figure, perception of ideal female figure, perception of current body mass, and perception of ideal body mass), self-esteem (global self-esteem, and physical self-esteem), social parameters (husbands perceptions of their wives' bodies, the ideal female figure among Bahraini men, social status of the sample groups).

The findings indicated that the body composition measurements of the two groups were significantly different. The older women were on average 8.8 kg heavier, 9% fatter, and 1.8 cm shorter.

Most of the women in the two groups perceived themselves overweight but not obese, although, the measurements showed that they were obese (percentage body fat > 35%). These women also reported that they wanted to be thinner, and to lose an average of 12.7 kg, and 9.7 kg of body mass, for the older and the younger women respectively.

The two groups did not differ significantly in their body cathexis scores. However the older women scored significantly lower than the younger women in the body cathexis items related to health: resistance to illness, age, and knees. Body cathexis was found to correlate negatively and significantly ($r = -0.39$, $P < 0.05$) with percentage body fat in the younger group, and with body mass ($r = -0.45$), BMI ($r = -0.39$), fat mass ($r = -0.42$), and fat free mass ($r = -0.42$), all at $P < 0.05$, in the older group. This implies that the

thinner and the lighter the women were, the more positively they felt about their body parts and functions.

The younger and the older women were shown to be dissatisfied with their bodies, as their ideal female figure was significantly thinner than their perceived current figure ($F = 77.8$, $P < 0.001$, Tukey $P < 0.05$). The older women appeared to be more extreme in idealising a thinner female figure, though the differences were not significant. The two groups also perceived their ideal body mass to be lighter (about 6.7kg for the younger and 9 kg for the older) than both the perceived and the actual body mass.

Both the married women (younger and older) and their husbands idealised a much thinner female figure than the wives' figures ($F = 2.64$, $P < 0.05$, Scheffé < 0.05). The older husbands showed a tendency to idealise a fatter female figure than their wives and than the younger group of men. Both groups of women who perceived their figures to be fat, also perceived their bodies to be less attractive.

The hierarchical structure of global self-esteem and Physical Self Perception Profile (PSPP) was found to be in a different direction than that proposed by Fox and Corbin (1989). The hierarchical model of these authors, constructed in accordance with correlations between self-esteem variables, suggests that global self-esteem is located at the apex level, physical self worth domain of the PSPP is located at the second level, and the four subdomains of the PSPP (sport, condition, body, and strength) are located at the third level (Fox & Corbin 1989). For the younger women the self-esteem model was organised with global self-esteem at the apex level, physical self worth (PSW) at the second level, body and condition subdomains at the third level. Sport subdomain descended from the condition subdomain (fourth layer), and strength descended from the sport subdomain (fifth layer). For the older women, the model was different. There was no evidence of global self-esteem in this model (it did not correlate significantly with any of the PSPP items). Physical self worth (PSW) was located at the apex level, and only body and condition subdomains were located in the second level. For these

two groups, it appeared that the body and condition were the most important aspects in their physical self-esteem.

The model of the older women suggested that there may be a missing link between global self-esteem and physical self worth, which could be related to priorities of health and well being.

PHASE II:

This phase comprised a three month exercise programme (3 days per week, 60 minutes per session), to investigate the effects of exercise on the body image, body composition, self-esteem, and physical fitness of Bahraini women.

37 women continued for 6 weeks, and 25 women completed the whole programme: the 25 women have been used for data analysis. Prior to the programme, the women reported dissatisfaction with their bodies, and they idealised a thinner female figure. The husbands of the married women also showed a preference towards a thinner female figure than their wives' current figure. The women indicated that they considered themselves obese and about 15.9 kg overweight which was the case.

The women were measured before, during, and after the exercise programme. The post exercise measurements indicated:

1. A significant reduction in most of the body composition measurements, including body mass (- 3 kg), percentage body fat (- 1%), fat mass (- 2.1 kg), and BMI (- 1.1 $kg.m^{-2}$), with Tukey test < 0.05 for all of them.
2. Significant improvements in their physical fitness test: cardio-respiratory endurance (Vo_2 max, $P < 0.05$), muscular endurance (the numbers of sit ups, $P < 0.001$), and flexibility ($P < 0.001$).
3. Significant improvements in their perceptions of their physical attractiveness, $P < 0.05$ (measured by PSPP).
4. Significant improvements in their feelings towards their weight ($P < 0.05$), waist ($P < 0.01$), and profile ($P < 0.05$) (measured by Body Cathexis Scale).

5. Significant improvements in their perceptions of their current figures, which became thinner (Tukey < 0.05).

6. Significant improvements in their perceptions of the ideal female figure (Tukey < 0.05), which became fatter and therefore moved towards their current figures. The women showed more appreciation of their current figures.

7. Significant improvements (Tukey < 0.05) in the husbands' perceptions of their wives' current figure (became thinner).

8. The husbands showed a tendency to idealise a fatter female figure to be their ideal by the end of the programme.

Psychological alterations reported in this study were more related to specific experiences (e.g. perception of physical attractiveness) than to general terms such as global self-esteem. This supports the notion of the stability of the self-esteem construct (Shavelson et al 1976). The exercise programme proved to be tolerable: the rate of adherence was 68%, which was higher than most studies reported (Robertson & Mutrie 1989). Such adherence should be considered excellent, especially when considering the populations studied (Muslim Bahraini sedentary women), and the climate of Bahrain during the programme (the hottest three months in Bahrain, with temperatures up to 50 degrees Celsius, and relative humidity arround 83%.

CONCLUSION

The findings of this study support the notion that there is an "ideal" female figure for both younger and older Bahraini women, similar to that reported in Western and North American societies. As a consequence, the women were not satisfied with their bodies and wanted to lose weight. A preference for a thin female figure among the Bahraini men was also reported. This ideal was different from their wives' current figures, implying that these male groups (some were the husbands of the sample women) were not happy with their wives' bodies and desired a thinner female figure. Husbands are the most "significant others" in Bahraini wives' lives, and their opinions on their wives' bodies are crucial. It is likely that husbands' attitudes towards their wives' bodies contribute to women's dissatisfactions with their current figures and their preference for a very thin figure.

The literature provided some misleading information about non-Western women's and men's ideal, in that studies in this area suggested that obsession with thinness is only found among Western women. Studies also reported that eating disorder diseases which are believed to be associated with dissatisfaction with the body, are more prevalent among Western women. But the only explanation of this connection between Western culture and thinness in women among investigators is the absence of non-Western data. This study provided information that in societies which are strongly influenced by the West, especially when these societies are going through social changes and reforms (e.g. Bahrain), a similar or even a relatively thinner Western "ideal" was found among women. Unfortunately, it was not possible for this study to provide information about the existence of eating disorder diseases. However, some indicators, e.g. dissatisfaction with the current figure, the perception of overweight, and the desire to be thinner and to lose weight could suggest similar pressures towards eating disorders.

Whilst the sample groups showed interest in a thin body, obesity is highly prevalent among them. This is also reported in the West (Garner et al 1980). Previous research reported that obesity among adult women is increasing in Bahrain (Musaiger & Al. Ansari 1992). Obesity is known to be a risk factor for

many diseases such as cardiac heart diseases, stroke, diabetes, and some forms of cancer. There are several factors contributing to obesity and lack of activity is one of them. Therefore, encouraging Bahraini women to participate in exercise seems to offer a promising way to address this problem.

The exercise programme used in this study was shown to be effective in changing the Bahraini women's body components (body mass and body fat), physical fitness, and some psychological variables. The programme lasted for three months, so it is unknown whether these changes would continue or be maintained if the women continue exercising. This issue is very important for future research. Another aspect that needs to be explained is the direction of change in fat free mass (FFM) with exercise among the women in this study. Maintenance of or an increase in FFM is considered as an advantage of exercise over other weight reduction methods (e.g. diet). In this study, the women's FFM decreased by about 0.9 kg during the first six weeks of the exercise programme and then levelled off. This could be related to the interference of some sort of diet in some women, or from the exercise programme itself.

This study showed that there is no reason for Bahraini Muslim sedentary women not to engage in exercise programmes. Most of the women claimed that they did not exercise because of lack of time, the hot weather, and because there is no private place for them to exercise. The women in this study tolerated the hottest temperature in Bahrain, they trained during the evening time (8 to 9 p.m.), and in a separate place where no men were allowed.

This study was subject to several inescapable limitations which limit the generalisation of its findings. These limitations are related to the non-random sample selection and to the small sample group size. These limitations could not have been prevented because: first, the lack of studies on the various dimensions of Bahraini women's bodies required the researcher to explore a large number of variables, which required between 15 to 45 minutes to be collected from each subject; and second, the study included aspects which

were sensitive for many women in Bahrain e.g. body composition measurements and exercise programme, so that volunteers had to be used. However, the data indicated that the subjects (of both phases of the study) differed in their age, marital, occupational, and educational status, and the data provides indicative findings which could be applicable for women with similar backgrounds and social characteristics.

This study raised some questions which need to be investigated further. For example, the structure of the self-esteem construct in relation to the Physical Self Perception Profile (PSPP) was suggested to be hierarchical (Fox & Corbin 1989). This structure was found to be different in the younger and older Bahraini women. The global self-esteem of the older women was not correlated with any of the physical self esteem measures (PSPP). Although correlation does not imply causality, the correlational data were used to examine the hierarchical model of self-esteem, in a similar fashion to Fox and Corbin (1989). Thus it was suggested that there may be a missing link between the global self-esteem and physical self worth of the PSPP. This link is suggested to be related to concern and priority for health issues.

The findings of this study should be available to the Bahraini public, through the local news paper and other kind of presentations (e.g. lectures in girls' schools, University of Bahrain). It is important to educate the public about the consequences of obesity, and supply them with alternatives to counter this problem. Copying the Western ideal may seem to Bahrainis a way of modernisation. Being aware of this study's results would show them that Western professionals are providing evidence that the Western ideal has led people (women in particular) to develop certain physical and psychological problems (e.g. anorexia, depression, anxiety, obesity).

IMPLICATIONS:

The study of women's bodies is a critical and a sensitive issue, especially in Muslim and restricted communities. Administration of the existing methods and instruments which were basically developed on Western, mostly male

samples would not be appropriate for Muslim women. Therefore, modification of these methods and instruments is required. Such modifications need to be within the scientific framework of the instruments, without affecting their validity and reliability. For example, for a perfect measurement of subcutaneous fat, the skinfold caliper needs to be applied directly to the skin. This situation causes embarrassment in some women, who are reluctant to go through the measurement procedures. However, in this study, the women were measured with their light clothes on, the thicknesses of these clothes were measured separately and subtracted from the women skinfold thickness. This procedure might not be perfect, and errors in measurements could be expected, but after reviewing the literature, there appears to be no such perfect or error-free method of body composition measurement. Measurement errors of this kind could be minimised by careful training of the examiner, and if possible, one examiner should be assigned to take these measurements.

The multidisciplinary approach applied in this research proved to be essential to provide useful information, such as physiological, psychological, and sociological aspects of women's bodies, and the interaction between them. From this approach, it was established that Bahraini older and younger women's perceptions of and attitudes towards their bodies were influenced by several factors: (a) their actual body measurements, (b) others' opinions (their husbands), and (c) Western ideal. Furthermore, other aspects related to women's bodies which were not investigated in this study, could be examined when applying a multidisciplinary approach (e.g. religious influences).

The role of exercise in improving, not only the Bahraini women's body measurements and fitness levels, but also their perceptions of their own bodies which became closer to their ideal female figure, their feelings of their body attractiveness, and their husbands' opinions of their figures and the ideal female figure, suggests the importance of encouraging women of different ages and levels of fitness to take part in exercise. The exercise programme need not be severe and painful to be effective, since the

programme used in this study was simple and light This exercise programme was planned for sedentary women of different ages and body composition, which can be tolerable in a hot and humid weather. It also was flexible and adjustable according to the level of women's initial fitness (obtained from pre exercise fitness tests). The programme provided basic exercise guidelines for the women to continue with in their own time and at their own pace, and can be safely used with women with similar characteristics as the sample groups studied.

RECOMMENDATIONS FOR FUTURE RESEARCH:

This study provided information about the topic of "women's bodies", but raised several questions to be investigated in more detail.

1. The future research should be focused on different age groups of Bahraini women, to allow for generalisation.
2. A similar study is required to be addressed to Bahraini men of different age groups. Concern about the body among Western men is established, in which men showed the desire to be muscular (Lamb et al 1993). This issue is worth considering for Bahraini men.
3. The phenomena of "eating disorder diseases" need to be investigated in depth, especially among adolescents. This age group of females, who are going through many changes (physiological and psychological), are more susceptible to such eating disorders. To the researcher's knowledge, girls at primary and intermediate education are discussing dieting and other weight reduction procedures. Musaiger et al (1993) reported that obesity is found to exist in adolescent students in Bahrain. There is no such information regarding physiological, psychological, and sociological aspects of Bahraini adolescent's bodies, therefore research in this area is vital.
4. A further investigation on the etiology and consequences of obesity in Bahraini women. The activity and diet habits require close investigation.
5. Self-esteem (global and physical) structure in Bahraini women and men needs to be further investigated. Special consideration should be paid to the older population, and to study their concern about their health and its

consequences for their self-esteem. It is wise to use other global instruments to measure self-esteem (e.g. Rosenberg 1965).

6. Other types of exercise programme need to be used (eg.weight training), to investigate their effects on fat free mass and the other components of the body, on adherence as well as the psychological issues (body image and self-esteem).

7. A longer exercise programme with the inclusion of a control sample group could be used to establish whether improvements in body dimensions are related to exercise alone, although in a country with such a small population controlling these variables would be very difficult.

8. A combination of exercise and diet is recommended for future research to study whether greater improvement in body composition would occur, together with the extent to which any changes could be related to body image and self-esteem.

9. A follow up research investigating whether exercise induced changes in the body are maintained.

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APPENDICES

Appendix I

1. Questionnaire booklet for women (English)
2. Questionnaire booklet for women (Arabic)
3. Questionnaire booklet for men (English)
4. Questionnaire booklet for men (Arabic)

Appendix II

PHYSICAL FITNESS

1. figure guidance
2. Scoring sheet
3. Plotting form

Appendix III

Description of the measurement sites

Appendix IV

Additional statistical tables

APPENDIX I

QUESTIONNAIRE BOOKLET FOR WOMEN



LEEDS METROPOLITAN UNIVERSITY

The following pages contain a questionnaire which I am using for research towards a PhD degree.

The questionnaire is designed to provide information about women's attitudes to their bodies.

All the information provided will be treated in strictest confidence.

Individual data will not be identifiable and the results are for research purposes only.

Please complete the questionnaire from front to back and do not skip any pages or questions.

Your help with this study is very much appreciated.

The Researcher
Mona Al Ansari

FACULTY OF CULTURAL AND EDUCATION STUDIES

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QUESTIONNAIRE CONTENT

Section I :	General information
Section II:	Body Cathexis Scale
Section III:	Weight related questionnaire
Section IV:	Silhouette choice
Section V:	Global self-esteem
Section VI:	Physical Self Perception Profile (PSPP)
Section VII:	Perceived Importance Profile (PIP)

SECTION I

General Information

1. Age: _____ years.

2. Home Post Code: _____

3. Marital status: Single ☐ Married ☐ Separated ☐ Divorced ☐ Widowed ☐

4. If you are married, how old were you when you got married? _____ years.

5. Have you got children? Yes ☐ No ☐

6. If yes, how many? _____

7. How old are your children? _____

8. Occupation:
   - Working full time ☐
   - Working part time ☐
   - Retired ☐
   - Unemployed/not working ☐
   - Housewife ☐
   - In full time education ☐

9. If you are working, what is your occupation? _____

10. If you have a partner, what is the occupation of your partner? _____

11. At what age did you leave school? _____ years.

12. Have you been into higher or further education? Yes ☐ No ☐

13. If yes, what was the highest qualification obtained?

14. Do you have your own car? Yes ☐ No ☐

15. Does your partner have his/her own car? Yes ☐ No ☐

16. If yes to question 14, how often each week do you use a car in travelling? _____

17. Are you on any weight reduction programme? Yes ☐ No ☐

18. If yes, what kind of the following programmes are you in?

1. Exercise ☐ 2. Diet ☐ 3. Exercise & Diet ☐

19. Are you on any weight maintenance programme? Yes ☐ No ☐

20. If yes, what kind of the following programmes are you in?

1. Exercise ☐ 2. Diet ☐ 3. Exercise & Diet ☐

SECTION II

On the following pages is a list of personal characteristics.

Please indicate whether you are satisfied, dissatisfied or neutral about each of these characteristics using the scale below.

1	2	3	4	5
very dissatisfied	dissatisfied	neutral	satisfied	very satisfied

Items\ Scores	Very dis-satisfied	Dissatisfied	Neutral	Satisfied	Very Satisfied
1. Hair					
2. Facial complexion					
3. Appetite					
4. Hands					
5. Body hair distribution					
6. Nose					
7. Physical stamina					
8. Digestion/ elimination					
9. Muscular strength					
10.Waist					
11.Energy level					
12.Back					
13.Ears					
14.Age					
15.Chin					
16.Body build					
17.Profile					
18.Height					
19.Keenness of senses					
20.Pain tolerance					
21.Shoulder width					
22.Arms					
23.Chest					
24.Eyes					
25.Coordination					
26.Hips					

Items\Scores	Very dis-satisfield	Dissatisfied	Neutral	Satisfied	Very satisfied
27.Resistance to illness					
28.Legs					
29.Teeth					
30.Overall appearance					
31.Muscle tone					
32.Sleep					
33.Voice					
34.Health					
35.Physical skills					
36.Knees					
37.Flexibility					
38.Face					
39.Weight					
40.Breasts					

SECTION III

Please answer the following questions.

1. How much do you think you weigh? _____st. _____lbs

2. Do you consider yourself overweight? Yes ☐ No ☐

If your answer to question 2 is yes please answer questions 3,4 and 5. Otherwise, go directly to question 6.

3. From where did you get the idea that you are overweight?
Please tick below: you may choose more than one.

1. Friends ☐
2. Family ☐
3. Husband or partner ☐
4. Yourself ☐
5. Other sources, please specify ☐ _____

_____

4. Do you consider yourself overweight in relation to:-

1. Other females of your age ☐
2. Movie stars ☐
3. Fashion models ☐
4. Sports women ☐
5. Your previous weight ☐
6. Others, please specify ☐ _____

_____

5. How overweight do you think you are: _____st. _____lbs

6. In the past, have you been overweight? Yes ☐ No ☐

7. If yes, what age(s) were you when you were overweight? _____

8. Are you satisfied with your height? Yes ☐ No ☐

9. Do you consider yourself to be either:-

Short ☐ Medium ☐ Tall ☐ (please tick one box)

10. How tall do you think you are? _____ft. _____inches

11. In your opinion, what weight would you consider to be ideal for yourself now?

_____st _____lbs

12. Does your ideal weight now differ from your ideal in previous years?

Yes ☐ No ☐

13. If yes,(a) what was your previous ideal weight and (b) how old were you then?

(a)_____st _____lbs (b) _____years

14. Do you consider yourself to be too fat? Yes ☐ No ☐

IF YOUR ANSWER IS NO, PLEASE GO STRAIGHT TO QUESTION 16.

IF YOUR ANSWER IS YES, PLEASE CONSIDER THE FOLLOWING CAREFULLY.

15. (a) Indicate with a tick in column a which parts of your body you think are too fat.
(b) In column b rank the ticked items from 1 upwards with 1 being the most fat. You may rank several items with the same number.
(c) In column c choose from the listed reasons why would you like to change if possible these items with which you are dissatisfied. Please consider each item separately. You may use more than one reason for each item.

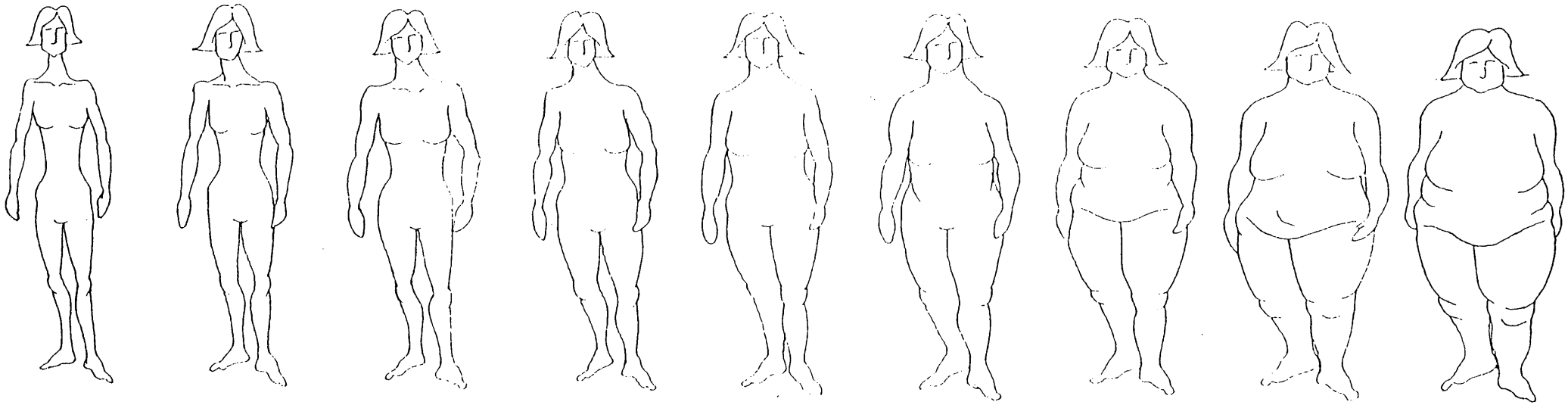
	15a	15b	15c	
Body parts	Tick box	Ranking	Reasons	Reasons:
Face				1. Personal vanity
Neck				2. Personal satisfaction
Chin				3. Attractiveness to others
Shoulders				4. Social desirability
Upper-arms				5. Attraction
Back				6. Keep husband/partner happy
Waist				7. Find fitting clothes
Stomach				8. Fear of chronic illness (eg hyper tension)
Abdominal				9. A more healthier attitude
Hips				10. Wish to live longer and healthier
Thighs				11. Move better
Calves				12. Changing lifestyle
Legs (overall)				13. Achieve physical fitness
				14. Achieve physical strength.

16. Please place a tick next to the body parts with which you are satisfied, in terms of fatnes

Face		Waist	
Neck		Stomach	
Chin		Abdominal	
Shoulders		Hips	
Upper-arms		Thighs	
Back		Calves	
Bust		Legs (overall)	

SECTION IV

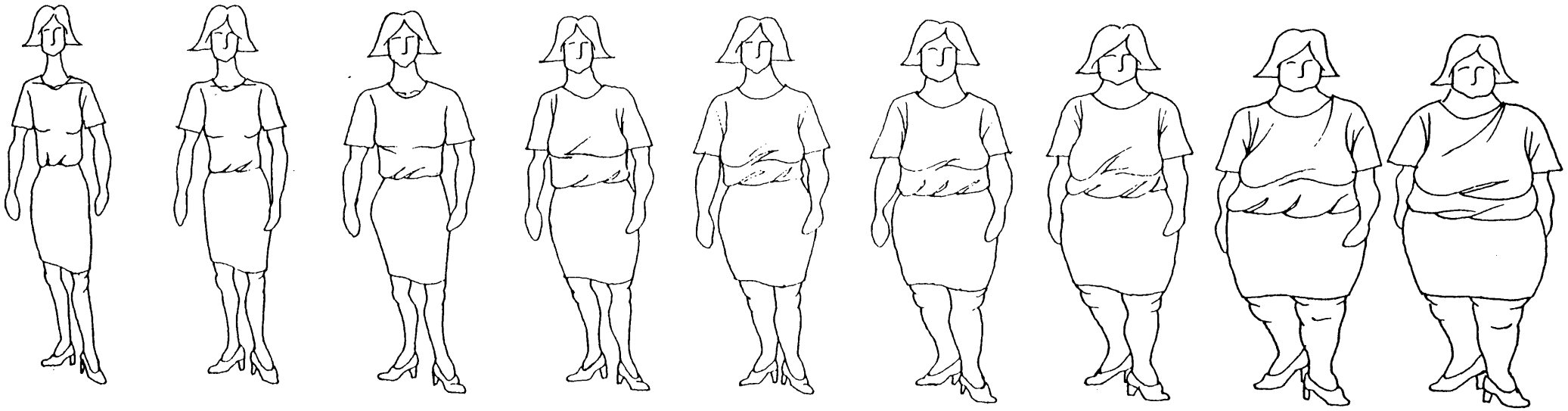
The following pages contain three sheet of women's silhouettes, please answer the questions below each sheet.



1 2 3 4 5 6 7 8 9

Question 1: Which figure most nearly represents your figure.
Pick a number from the above list._____

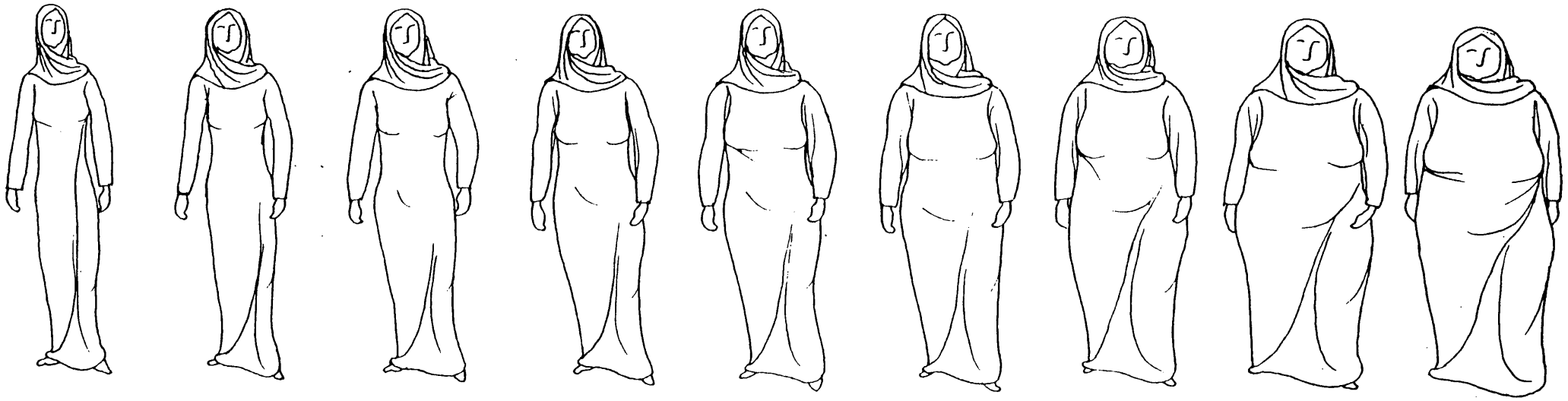
Question 2: Which figure is closest to the figure of your "ideal woman".
Pick a number from the above list._____



1 2 3 4 5 6 7 8 9

Question 1: Which figure most nearly represents your figure.
Pick a number from the above list_____

Question 2: Which figure is closest to the figure of your "ideal woman".
Pick a number from the above list_____



Question 1: Which figure most nearly represents your figure.
Pick a number from the above list _____

Question 2: Which figure is closest to the figure of your "ideal woman".
Pick a number from the above list _____

SECTION V

Directions

On the form below, you will find a list of statements about feelings. If a statement describes how you usually feel, put an X in the column "Like Me". If a statement does not describe how you usually feel, put an X in the column "Unlike Me". There are no right or wrong answers. Begin at the top of the page and mark all 25 statements.

Like Me	Unlike Me	
☐	☐	1. Things usually don't bother me.
☐	☐	2. I find it very hard to talk in front of a group.
☐	☐	3. There are lots of things about myself I'd change if I could.
☐	☐	4. I can make up my mind without too much trouble.
☐	☐	5. I'm a lot of fun to be with.
☐	☐	6. I get upset easily at home.
☐	☐	7. It takes me a long time to get used to anything new.
☐	☐	8. I'm popular with persons my own age.
☐	☐	9. My family usually considers my feelings.
☐	☐	10. I give in very easily.
☐	☐	11. My family expects too much of me.
☐	☐	12. It's pretty tough to be me.
☐	☐	13. Things are all mixed up in my life.
☐	☐	14. People usually follow my ideas.
☐	☐	15. I have a low opinion of myself.
☐	☐	16. There are many times when I would like to leave home.
☐	☐	17. I often feel upset with my work.
☐	☐	18. I'm not as nice looking as most people.
☐	☐	19. If I have something to say, I usually say it.
☐	☐	20. My family understands me.
☐	☐	21. Most people are better liked than I am.
☐	☐	22. I usually feel as if my family is pushing me.
☐	☐	23. I often get discouraged with what I am doing.
☐	☐	24. I often wish I were someone else.
☐	☐	25. I can't be depended on.

SECTION VI

WHAT AM I LIKE?

These are statements which allow people to describe themselves.
There are no right or wrong answers since people differ a lot.

First, decide which one of the two statements best describes you.

Then, go to that side of the statement and check if it is just
"sort of true" or "really true" FOR YOU.

Really True for Me	Sort of True for Me	EXAMPLE			Sort of True for Me	Really True for Me
☐	☐	Some people are very competitive	BUT	Others are not quite so competitive	☒	☐

REMEMBER to check only ONE of the four boxes

1.	☐	☐	Some people feel that they are not very good when it comes to playing sports	BUT	Others feel that they are really good at just about every sport	☐	☐
2.	☐	☐	Some people are not very confident about their level of physical conditioning and fitness	BUT	Others always feel confident that they maintain excellent conditioning and fitness	☐	☐
3.	☐	☐	Some people feel that compared to most, they have an attractive body	BUT	Others feel that compared to most, their body is not quite so attractive	☐	☐
4.	☐	☐	Some people feel that they are physically stronger than most people of their sex	BUT	Others feel that they lack physical strength compared to most others of their sex	☐	☐
5.	☐	☐	Some people feel extremely proud of who they are and what they can do physically	BUT	Others are sometimes not quite so proud of who they are physically	☐	☐
6.	☐	☐	Some people feel that they are among the best when it comes to athletic ability	BUT	Others feel that they are not among the most able when it comes to athletics	☐	☐

	Really True for Me	Sort of True for Me			Sort of True for Me	Really True for Me
7.	☐	☐	Some people make certain they take part in some form of regular vigorous physical exercise	BUT	Others don't often manage to keep up regular vigorous physical exercise	☐ ☐
8.	☐	☐	Some people feel that they have difficulty maintaining an attractive body	BUT	Others feel that they are easily able to keep their bodies looking attractive	☐ ☐
9.	☐	☐	Some people feel that their muscles are much stronger than most others of their sex	BUT	Others feel that on the whole their muscles are not quite so strong as most others of their sex	☐ ☐
10.	☐	☐	Some people are sometimes not so happy with the way they are or what they can do physically	BUT	Others always feel happy about the kind of person they are physically	☐ ☐
11.	☐	☐	Some people are not quite so confident when it comes to taking part in sports activities	BUT	Others are among the most confident when it comes to taking part in sports activities	☐ ☐
12.	☐	☐	Some people do not usually have a high level of stamina and fitness	BUT	Others always maintain a high level of stamina and fitness	☐ ☐
13.	☐	☐	Some people feel embarrassed by their bodies when it comes to wearing few clothes	BUT	Others do not feel embarrassed by their bodies when it comes wearing few clothes	☐ ☐
14.	☐	☐	When it comes to situations requiring strength some people are one of the first to step forward	BUT	When it comes to situations requiring strength some people are one of the last to step forward	☐ ☐
15.	☐	☐	When it comes to the physical side of themselves some people do not feel very confident	BUT	Others seem to have a real sense of confidence in the physical side of themselves	☐ ☐
16.	☐	☐	Some people feel that they are always one of the best when it comes to joining in sports activities	BUT	Others feel that they are not one of the best when it comes to joining in sports activities	☐ ☐

	Really True for Me	Sort of True for Me			Sort of True for Me	Really True for Me
17.	☐	☐	Some people tend to feel a little uneasy in fitness and exercise settings	BUT	Others feel confident and at ease at all times in fitness and exercise settings	☐ ☐
18.	☐	☐	Some people feel that they are often admired because their physique or figure is considered attractive	BUT	Others rarely feel that they receive admiration for the way their body looks	☐ ☐
19.	☐	☐	Some people tend to lack confidence when it comes to their physical strength	BUT	Others are extremely confident when it comes to their physical strength	☐ ☐
20.	☐	☐	Some people always have a really positive feeling about the physical side of themselves	BUT	Others sometimes do not feel positive about the physical side of themselves	☐ ☐
21.	☐	☐	Some people are sometimes a little slower than most when it comes to learning new skills in a sports situation	BUT	Others have always seemed to be among the quickest when it comes to learning new sports skills	☐ ☐
22.	☐	☐	Some people feel extremely confident about their ability to maintain regular exercise and physical condition	BUT	Others don't feel quite so confident about their ability to maintain regular exercise and physical condition	☐ ☐
23.	☐	☐	Some people feel that compared to most, their bodies do not look in the best of shape	BUT	Others feel that compared to most their bodies always look in excellent physical shape	☐ ☐
24.	☐	☐	Some people feel that they are very strong and have well developed muscles compared to most people	BUT	Others feel that they are not so strong and their muscles are not very well developed	☐ ☐
25.	☐	☐	Some people wish that they could have more respect for their physical selves	BUT	Others always have great respect for their physical selves	☐ ☐
26.	☐	☐	Given the chance, some people are always one of the first to join in sports activities	BUT	Other people sometimes hold back and are not usually among the first to join in sports	☐ ☐

	Really True for Me	Sort of True for Me			Sort of True for Me	Really True for Me
27.	☐	☐	Some people feel that compared to most they always maintain a high level of physical conditioning	BUT	Others feel that compared to most their level of physical conditioning is not usually so high	☐ ☐
28.	☐	☐	Some people are extremely confident about the appearance of their body	BUT	Others are a little self-conscious about the appearance of their bodies	☐ ☐
29.	☐	☐	Some people feel that they are not as good as most at dealing with situations requiring physical strength	BUT	Others feel that they are among the best at dealing with situations which require physical strength	☐ ☐
30.	☐	☐	Some people feel extremely satisfied with the kind of person they are physically	BUT	Others sometimes feel a little dissatisfied with their physical selves	☐ ☐

SECTION VII

	Really True for Me	Sort of True for Me			Sort of True for Me	Really True for Me
1.	☐	☐	Some people feel that being good at sports is vitally important to them	BUT	Others feel that being good at sports is not so important to them	☐ ☐
2.	☐	☐	Some people do not feel that maintaining a high level of physical conditioning is very important to them	BUT	Others feel that maintaining a high level of physical conditioning is extremely important to them	☐ ☐
3.	☐	☐	Some people believe that having an attractive physique or figure is vitally important to them	BUT	Others believe that having an attractive physique or figure is not all that important in their lives	☐ ☐
4.	☐	☐	Some people believe that being physically strong is not so important to them	BUT	Others feel that it is extremely important to them to be physically strong	☐ ☐
5.	☐	☐	Some people feel that having very good sports ability and skill is not so important to them	BUT	Others feel that having a high level of sports ability is really important to them	☐ ☐
6.	☐	☐	Some people feel that maintaining regular vigorous exercise is vitally Important to them	BUT	Others feel that keeping up regular vigorous exercise is not of prime importance to them	☐ ☐
7.	☐	☐	Some people do not feel it so important to them to spend a lot of time and effort maintaining an attractive body	BUT	Others think that it is vitally important to spend time and effort maintaining an attractive body	☐ ☐
8.	☐	☐	Some people feel that being strong and having well developed/toned muscles is vitally important to them	BUT	Others feel that being strong and having well developed/toned muscles is not so important to them	☐ ☐

استبيان بحث

العلاقات بين مكونات الجسم وصورة الجسم وتقدير الذات عند النساء البحرينيات

(استبيان النساء)

اعـــــداد

منى الانصارى

اخصائية الانشطة النسائية
معهد البحرين الرياضي
المؤسسة العامة للشباب والرياضة
دولة البحرين

الاستبيان ضمن متطلبات الحصول على درجة الدكتوراه
١٩٩٣م

محتويات الاستبيان

- عزيزتي المستفتية .....
- الجزء الأول : معلومات عامة .....
- الجزء الثاني : الصفات الشخصية .....
- الجزء الثالث : وزن الجسم .....
- الجزء الرابع : صورة الجسم .....
- الجزء الخامس : تقدير الذات .....
- الجزء السادس : تقدير الذات الجسمية .....
- الجزء السابع : اهمية الذات الجسمية .....

عزيزتى المستفتية

تحتوى الصفحات التالية على استبيان يتضمن سبع اجزاء كاحد متطلبات الحصول على درجة الدكتوراه لاخصائية البرامج النسائية في معهد البحرين الرياضي الآنسة منى الانصارى.

ويستهدف هذا الاستبيان توفير بعض المعلومات والمعارف عن كل ما يتعلق بجسم المراة البحرينية.

والجدير بالذكر أن جميع المعلومات والبيانات المعطاة من قبلك سوف يتم تحليلها بصورة جماعية وبسرية تامة ولن تستخدم إلا لاغراض هذا البحث.

لذا.. ، يرجى التكرم بقراءة التعليمات أولا قبل البدء في الإجابة على أى سؤال، كما يجب الاجابة على جميع الاسئلة دون استثناء.

ولا شك ان ما سوف تتفضلين باقراره من معلومات وبيانات سيكون له عظيم الأثر على نتائج البحث بحيث يسمح بالوصول إلى تحليل دقيق للتكوين البدنى والنفسي للمراة البحرينية وذلك تمهيدا لوضع عدد من التوصيات والمشروعات يؤمل منها تحقيق الفائدة لك ولاقرانك من نساء البحرين.

الجزء الأول ..... معلومات عامة

● برجاء استيفاء البيانات المطلوبة ، ووضع علامة (×) أمام ما يناسبك :

١ – **العمر :** ..... لاقرب سنة

٢ – **العنوان :** منطقة السكن فقط: .....

٣ – **عدد غرف المنزل :** ..... غرفة.

٤ – **الحالة الزواجية :**

أ – عازبة ..... ☐
ب – متزوجة ..... ☐
جـ – منفصلة ..... ☐
د – مطلقة ..... ☐
هـ – أرملة ..... ☐

٥ – **في حالة المتزوجة:** كم كان عمرك عند الزواج؟ ..... سنة
(في حالة تعدد الزواج يذكر العمر عند الزواج الاول فقط).

٦ – **هل لديك اطفال ؟**

أ – نعم ..... ☐
ب – لا ..... ☐
كم عدد الأطفال في حالة الاجابة بنعم .....

٧ – **ما هى تواريخ ميلاد الأطفال؟ ، ونوع مدارسهم لمن في سن التعليم (خاص، حكومى) والجنس (ذكر ، انثى) :**

	سنة الميلاد	التعليم	الجنس		سنة الميلاد	التعليم	الجنس
الطفل الأول	.....	.....	.....	الطفل السادس	.....	.....	.....
الطفل الثاني	.....	.....	.....	الطفل السابع	.....	.....	.....
الطفل الثالث	.....	.....	.....	الطفل الثامن	.....	.....	.....
الطفل الرابع	.....	.....	.....	الطفل التاسع	.....	.....	.....
الطفل الخامس	.....	.....	.....	الطفل العاشر	.....	.....	.....

٨ - العمل :

أ - اعمل (دوام كامل) .....

ب - اعمل (عمل جزئي) .....

جـ - متقاعدة .....

د - عاطلة .....

هـ - ربة بيت .....

و - طالبة (لكل الوقت - متفرغة) .....

٩ - في حالة العاملة (دوام كامل أو جزئي) : ما هو نوع العمل .....

١٠- في حالة المتزوجات : ما هو عمل الزوج ؟ .....

١١- المستوى التعليمي :

أ - غير متعلمة .....

ب - ابتدائي .....

حـ - اعدادي .....

د - ثانوي .....

هـ - تعليم عال .....

١٢- في حالة التعليم العالى من السؤال السابق (رقم ١٢) :

ما هو اعلى مؤهل حصلت عليه ؟

أ - دبلوم .....

ب - بكالوريوس - ليسانس .....

حـ - دبلوم عال .....

د - ماجستير .....

هـ - دكتوراه .....

١٣- هل تملكين سيارة ؟

أ - نعم .....

ب - لا .....

١٤- **للمتزوجات :** هل يملك زوجك سيارة ؟

أ - نعم ..... ☐

ب - لا ..... ☐

١٥- **اذا كنت تملكين سيارة :** كم يوم في الاسبوع تستخدمين السيارة ؟ ..... يوميا.

١٦- **اذا كنت تملكين سيارة :** ما هو المعدل التقريبي للاستخدم اليومي السيارة ؟ ..... كم.

١٧- **في حالة العمل :** ما هو متوسط دخلك الشهري ؟ ..... دينار.

١٨- **ما هو متوسط دخل الزوج الشهري** ..... دينار.

١٩- **هل تمارسين اي برنامج للتحكم في الوزن ؟**

	نعم	لا
أ - برنامج لانقاص الوزن	☐	☐
ب - برنامج للمحافظة على الوزن	☐	☐
حـ - برنامج لزيادة الوزن	☐	☐

٢٠- **في حالة الاجابة بنعم على اى من البرامج المذكورة ما هو نوع البرنامج ؟**

أ - التمرينات الرياضية فقط ..... ☐

ب - النظام الغذائي فقط ..... ☐

حـ - العلاج الطبي فقط ..... ☐

د - التمرينات الرياضية + النظام الغذائي ..... ☐

هـ - التمرينات الرياضية + العلاج الطبي ..... ☐

و - النظام الغذائي + العلاج الطبي ..... ☐

ز - التمرينات الرياضية + النظام الغذائى + العلاج الطبي ..... ☐

الجزء الثاني ..... الصفات الشخصية

يتضمن هذا الجزء من الاستبيان قائمة من الصفات الشخصية ، والمطلوب تحديد درجة الرضا أو عدم الرضا تجاه هذه الصفات وفقا للمقاييس الموضحة في الجدول التالي : برجاء وضع علامة (×) اسفل احد مستويات الرضا الخمسة المقترحة، وامام كل صفة من الصفات الواردة .. ، هذا ويلزم استيفاء جميع الصفات المذكورة.

م	الصفات	غير راضية تماما	غير راضية	محايدة	راضية	راضية تماما
١	الشعر					
٢	بشرة الوجه					
٣	الشهية					
٤	الكفان					
٥	توزيع شعر الجسم					
٦	الانف					
٧	التحمل البدني					
٨	الهضم / الاخراج					
٩	القوة العضلية					
١٠	الخصر					
١١	مستوى الطاقة					
١٢	الظهر					
١٣	الاذنان					
١٤	العمر					
١٥	النقن					
١٦	بناء الجسم					
١٧	الشكل الجانبي للجسم (بروفيل)					
١٨	الطول					
١٩	حدة الحواس					

تابـــــع

م	الصفات	غير راضية تماما	غير راضية	محايدة	راضية	راضية تماما
٢٠	تحمل الألم					
٢١	عرض الكتفان (المنكبان)					
٢٢	الذراعان					
٢٣	الصدر					
٢٤	العينان					
٢٥	التوافق (سلاسة الحركة)					
٢٦	الحوض					
٢٧	مقاومة المرض					
٢٨	الرجلان					
٢٩	الاسنان					
٣٠	المظهر العام					
٣١	النغمة العضلية (عدم الترهل)					
٣٢	النوم					
٣٣	الصوت					
٣٤	الصحة					
٣٥	المهارات البدنية					
٣٦	الركبتان					
٣٧	المرونة					
٣٨	الوجه					
٣٩	الوزن					
٤٠	الثديان					

الجزء الثالث ..... وزن الجسم

● برجاء الاجابةعلى الاسئلة التالية اي وضع علامة (×) أمام الاجابة المناسبة لك :

١ - كم يبلغ وزنك حسب اعتقادك ؟ : ..... ——— كجم/ رطل.

٢ - هل تعتقدين ان وزنك زائد ؟

أ - نعم ..... ☐

ب - لا ..... ☐

في حالة الاجابة بـ لا يرجى عدم الاجابة على الاسئلة (٣ - ٤ - ٥).يمكنك أختيار اكثر من مصدر.

٣ - من اين اتتك فكرة ان وزنك زائد ؟

أ - الاصدقاء ..... ☐

ب - الاسرة ..... ☐

جـ - الزوج ..... ☐

د - من ذاتى ..... ☐

هـ - من مصادر اخرى ..... ☐

وما هو هذا المصدر ؟ .....

٤ - هل تعتقدين بان وزنك زائد عند المقارنة مع : (يمكنك اختيار اكثر من إجابة)

أ - نساء من نفس عمرك ..... ☐

ب - نجوم السينما والتليفزيون ..... ☐

جـ - عارضات الازياء ..... ☐

د - النساء الرياضيات ..... ☐

هـ - وزنك السابق ..... ☐

و - مصادر اخرى ..... ☐

وما هو هذا المصدر ؟ .....

٥ - كم تعتقدين مقدار الزيادة في وزنك ؟ ..... ——— كجم/ رطل.

٦ - هل كان وزنك زائد فى السابق ؟

أ - نعم ..... ☐

ب - لا ..... ☐

٧ - اذا كانت الاجابة بنعم على السؤال السابق (رقم ٦) :

كم كنت تبلغين من العمر حين ذلك ..... ——— عاما.

٨ - هل انت راضية عن طولك ؟

أ - نعم ..... ☐

ب - لا ..... ☐

٩ - كيف تصفين نفسك

أ - قصيرة ..... ☐

ب - متوسطة ..... ☐

جـ - طويلة ..... ☐

١٠- كم يبلغ طولك حسب اعتقادك ؟ ..... ——— سم/ قدم.

١١- ما هو في رايك الوزن المثالى المناسب لطولك ..... ——— كجم/ رطل.

١٣- هل يختلف هذا الوزن المثالي عن وزنك المثالي السابق (في السنوات السابقة من عمرك).

أ - نعم ..... ☐

ب - لا ..... ☐

١٣- اذا كانت الاجابة بنعم على السؤال السابق (رقم ١٢) :

أ - ماذا كان وزنك المثالي السابق ؟ ..... ——— كجم/ رطل.

ب - كم كان عمرك حين ذلك ؟ ..... ——— عاما.

١٤- هل تعتبرين نفسك سمينة

أ - نعم ..... ☐

ب - لا ..... ☐

● اذا كانت الاجابة بـ لا (عن السؤال رقم ١٤) ... الرجاء عدم اجابة السؤال رقم ١٥

١٥- (أ) - في العمود الاول من الجدول التالى الرجاء وضع علامة (×) لتحديد اى جزء من جسمك تعتبرينه سمينا.

١٥- (ب) - في العمود الثانى الرجاء ترقيم اجزاء الجسم المختارة في العمود الأول بالارقام من « ١ » فاكثر علما بأن الرقم «١» يدل على الجزء الاكثر سمنة، يمكنك ترقيم عدة اجزاء بنفس الرقم (عدة اجزاء من الجسم يمكن ان تحمل الرقم «١» مثلا).

١٥- (حـ) - في العمود الثالث يجب الاختيار من الاسباب التى على يسار الجدول والتى تجيب على السؤال التالى : اذا كنت ترغبين في تغيير الأجزاء التي اخترتيها في العمودين أ ، ب ، ما السبب الذي يدعوك لذلك ؟

الرجاء قراءة كل جزء من اجزاء الجسم المختارة في العمودين الاولين، ثم وضع الاسباب التى تختارينها له. يمكنك اختيار اكثر من سبب لنفس الجزء.

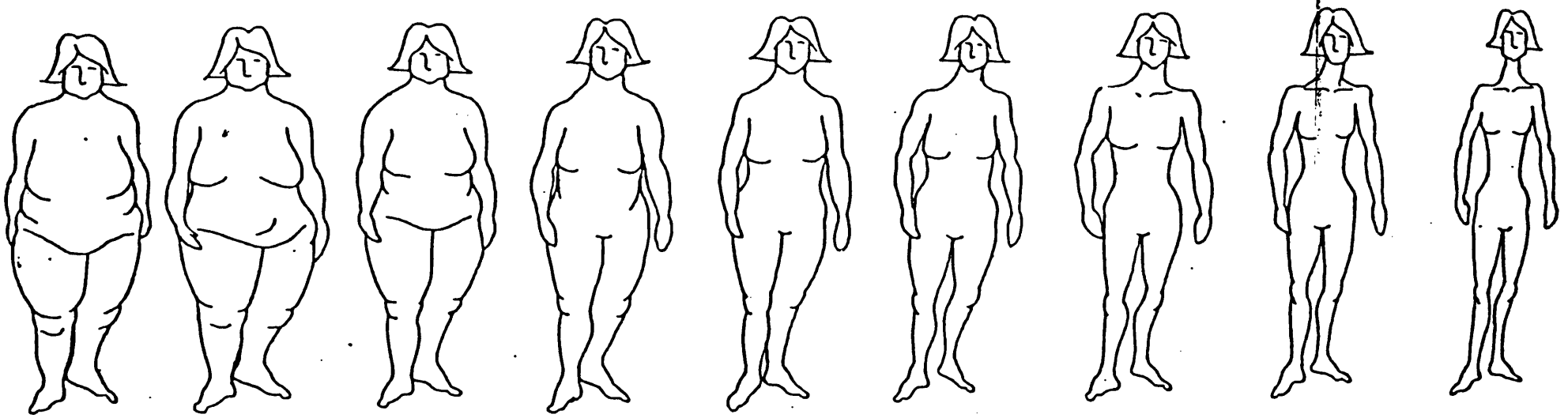
اجزاء الجسم	١٥ أ	١٥ ب	١٥ جـ	الاسباب
الوجه				١ - الزهو الشخصى.
العنق				٢ - الرضا الشخصى.
النقن				٣ - شد انتباه الآخرين.
الكتفان (المنكبان)				٤ - مظهر اجتماعى مرغوب فيه.
اعلى الذراعان (العضدان)				٥ - الجانبية.
الظهر				٦ - إرضاء الزوج / الاحتفاظ بالسعادة.
الثديان				٧ - ايجاد الملابس المناسبة.
الخصر				٨ - الخوف من الامراض المزمنة مثل (ارتفاع ضغط الدم).
المعدة (الجزء العلوى من البطن)				٩ - اكتساب الاتجاهات الصحية السليمة.
البطن				١٠- الرغبة في حياة طويلة صحية.
الحوض				١١- من اجل حركة افضل.
الفخذان				١٢- تغيير اسلوب الحياة.
الساقان				١٣- تحصيل لياقة بدنية.
الرجلان (ككل)				١٤- تحصيل القوة.
				١٥- اغراض اخرى: يرجى التحديد ———

١٦- في الجدول التالى الرجاء الاشارة بعلامة (×) مقابل الاجزاء الجسمية التى تحسين بالرضا عنها.

م			م		
١	الوجه		٨	الخصر	
٢	الرقبة		٩	المعدة (الجزء العلوى من البطن)	
٣	النقن		١٠	البطن	
٤	الكتفان		١١	الحوض	
٥	اعلى الذراعان (العضدان)		١٢	الفخذان	
٦	الظهر		١٣	الساقان	
٧	الثدى		١٤	الرجلان (ككل)	

الجزء الرابع ..... صورة الجسم

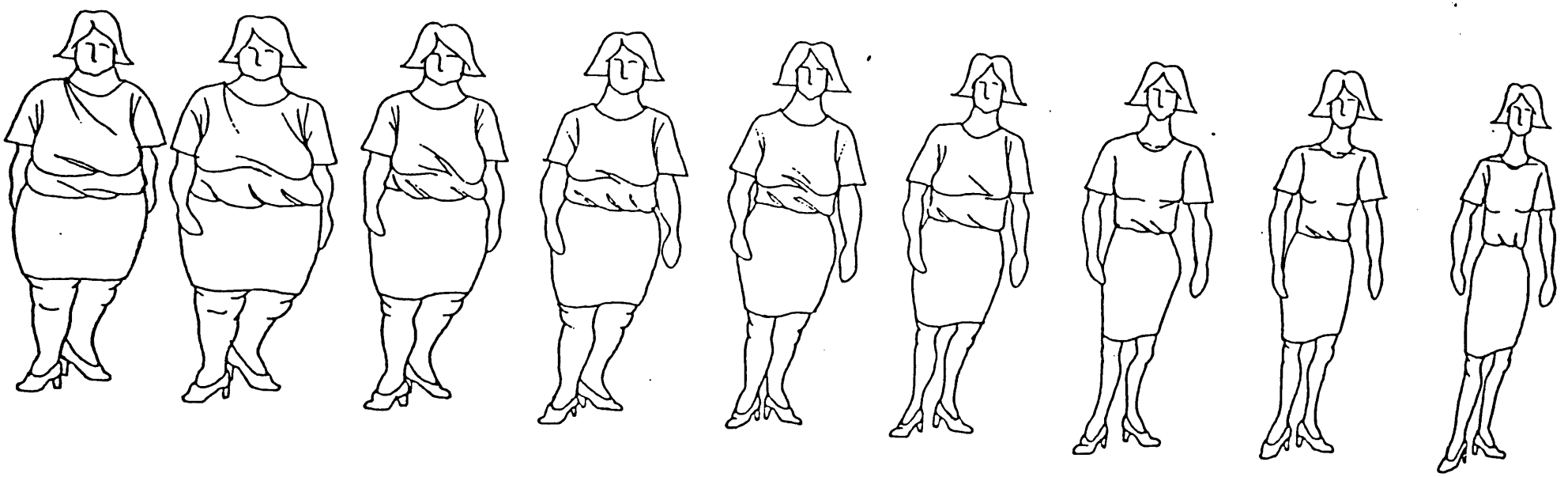
تتضمن الصفحات التالية بعض الاشكال المعبرة عن صورة جسم المراة
برجاء التكرم بفحص هذه الاشكال بدقة والاجابة على الاسئلة الواردة اسفل كل صفحة.



١ ٢ ٣ ٤ ٥ ٦ ٧ ٨ ٩

١- اكتبى رقم اقرب شكل من هذه الاشكال لجسمك ؟ _____

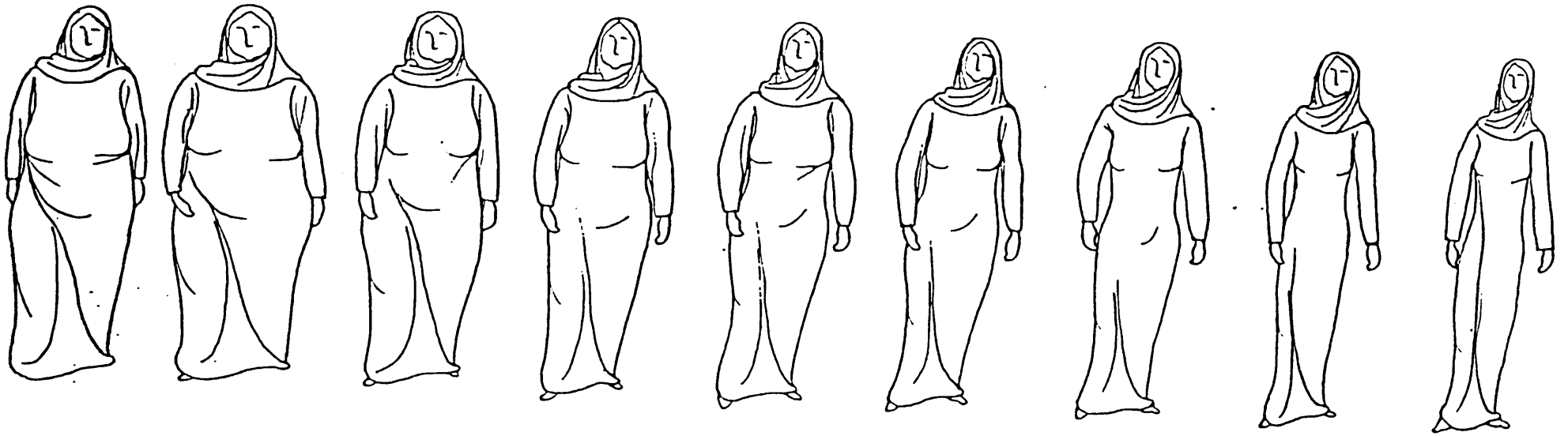
٢- اكتبى رقم الشكل الذى ترين فيه الجسم المثالي للمرأة ؟ _____



١ ٢ ٣ ٤ ٥ ٦ ٧ ٨ ٩

١ - اكتبى رقم اقرب شكل من هذه الاشكال لجسمك ؟ _____

٢ - اكتبى رقم الشكل الذى ترين فيه الجسم المثالي للمرأة ؟ _____



١ ٢ ٣ ٤ ٥ ٦ ٧ ٨ ٩

١ - اكتبى رقم اقرب شكل من هذه الاشكال لجسمك ؟ _____

٢ - اكتبى رقم الشكل الذى ترين فيه الجسم المثالي للمرأة ؟ _____

فيما يلي مجموعة من العبارات عن المشاعر الانسانية.. ، برجاء وضع علامة (×) في العمود اذا كانت العبارة تصف مشاعرك، اما اذا كانت العبارة لا تصف مشاعرك فالرجاء وضع علامة (×) في العمود الثاني.
للعلم لا توجد اجابة صحيحة أو خاطئة في هذا الاستبيان.

ينطبق علىّ	لا ينطبق علىّ		
☐	☐	١	عادة لا يضايقنى شىء .
☐	☐	٢	من الصعب جدا أن اتحدث امام مجموعة من الناس.
☐	☐	٣	لدى الكثير من الاشياء المتعلقة بي أرغب في تغييرها لو استطعت.
☐	☐	٤	استطيع اتخاذ القرار بدون متاعب كثيرة.
☐	☐	٥	اجد نفسي حلوة الصحبة.
☐	☐	٦	اغضب بسهولة في المنزل.
☐	☐	٧	يلزمنى الكثير من الوقت للتعود على أى شىء جديد.
☐	☐	٨	محبوبة من الاشخاص الذين في سنى.
☐	☐	٩	اسرتى عادة ما تراعى مشاعري.
☐	☐	١٠	استسلم بسهولة جدا.
☐	☐	١١	اسرتى تتوقع الكثير منى.
☐	☐	١٢	اجد نفسى صعبة.
☐	☐	١٣	الامور كلها مشوشة في حياتى.
☐	☐	١٤	الناس عادة ما تعمل بآرائي .
☐	☐	١٥	استصغر نفسى.
☐	☐	١٦	كثيرا من الاوقات اشعر فيها برغبة في مغادرة المنزل.
☐	☐	١٧	دائما ما احس بالغضب من عملي.
☐	☐	١٨	لست وسيمة كغالب الناس.
☐	☐	١٩	اذا كان عندى شيء اود قوله عادة ما أقوله بلا تردد.
☐	☐	٢٠	اسرتى متفهمة لى.
☐	☐	٢١	غالبية الناس محبوبين اكثر منى.
☐	☐	٢٢	عادة ما اشعر ان اسرتى تدفعنى لامور لا ارغب فيها.
☐	☐	٢٣	غالبا ما احس باحباط مما اقوم به.
☐	☐	٢٤	غالبا ما اتمنى ان اكون شخصا آخر.
☐	☐	٢٥	انني شخص لا يعتمد عليه.

العبارة التالية تمكنك من وصف نفسك، ولكون الناس مختلفين فلا توجد اجابات صحيحة او خاطئة.

فالرجاء اولا ان تحددى اى من العبارتين تصفك اكثر ثم اتجهى إلى الجهة (اليمنى او اليسرى) التى اخترتى العبارة منها لكى تحددى ما اذا كنتِ ممن تنطبق عليه العبارة تماماً او إلى حد ما.

الرجاء وضع علامة (×) على المربع المناسب... قبل الاجابة انظرى الى هذا المثال

تذكرى ان تختارى مربع واحد من ضمن الاربع مربعات

ينطبق على تماما	ينطبق على الي حد ما			ينطبق على الي حد ما	ينطبق على تماما
☐	☐	بعض الناس متنافسين جدا	ولكن	×	☐

	ينطبق على تماما	ينطبق على الي حد ما			ينطبق على الي حد ما	ينطبق على تماما
١ -	☐	☐	بعض الناس لديهم شعور بعدم الاجادة عند اقبالهم على ممارسة الرياضة	ولكن	اخرون يشعرون بالاجادة التامة عند اقبالهم على ممارسة جميع انواع الرياضة	☐	☐
٢ -	☐	☐	بعض الناس ليست لديهم الثقة التامة في مستوى حالتهم البدنية واياقتهم	ولكن	اخرون دائما لديهم شعور بالثقة فى امكانية المحافظة على حالتهم البدنية واياقتهم في مستوى ممتاز	☐	☐
٣ -	☐	☐	بعض الناس يشعرون بان اجسامهم جذابة بالمقارنة مع غالبية الاخرين	ولكن	اخرون يشعرون بان اجسامهم غير جذابة تماما بالمقارنة مع غالبية الاخرين	☐	☐
٤ -	☐	☐	بعض الناس يشعرون بكونهم اقوى بدنيا من غالبية الناس من نفس الجنس	ولكن	اخرون يشعرون بافتقارهم للقوة البدنية مقارنة مع غالبية الآخرين من نفس الجنس	☐	☐
٥ -	☐	☐	بعض الناس يشعرون بالفخر الزائد بانفسهم، وربما يمكنهم اداءه بدنيا	ولكن	اخرون احيانا لا يشعرون بالفخر التام بانفسهم.. وربما يمكنهم اداءه بدنيا	☐	☐
٦ -	☐	☐	بعض الناس يشعرون بانهم من ضمن الافضل في القدرات الرياضية	ولكن	اخرون يشعرون بانهم ليسوا ضمن ذوى القدرات الافضل في الرياضة	☐	☐
٧ -	☐	☐	بعض الناس يؤكدون على مشاركتهم في بعض اشكال التمرينات البدنية المنتظمة والمنيقة	ولكن	اخرون غالبا لا يستطعون الاستمرار في التمرينات البدنية المنتظمة والمنيقة	☐	☐
٨ -	☐	☐	بعض الناس يشعرون بصعوبة الاحتفاظ بجاذبية اجسامهم	ولكن	اخرون يشعرون بسهولة امكانية الاحتفاظ بجاذبية اجسامهم	☐	☐
٩ -	☐	☐	بعض الناس يشعرون بان عضلاتهم اكثر قوة من غالبية الآخرين من نفس الجنس	ولكن	اخرون يشعرون بشكل عام بان عضلاتهم غير قوية جدا عن غالبية الاخرين من نفس الجنس	☐	☐
١٠-	☐	☐	بعض الناس احيانا غير سعداء جدا بانفسهم، وربما يمكن ان يؤدوه بدنيا	ولكن	اخرون دائما يشعرون بالسعادة بانفسهم وربما يمكن ان يؤدوه بدنيا	☐	☐

تابع

	ينطبق علىّ تماما	ينطبق علىّ الي حد ما			ينطبق علىّ الي حد ما	ينطبق علىّ تماما
١١-	☐	☐	بعض الناس ليست لديهم ثقة تامة في انفسهم عند مشاركتهم في انشطة رياضية	ولكن	اخرون يعتبرون انفسهم ضمن من هم اكثر ثقة في انفسهم عند مشاركتهم في الانشطة الرياضية	☐	☐
١٢-	☐	☐	بعض الناس عادة ليس لديهم مستوى عال من التحمل واللياقة	ولكن	اخرون دائما يحافظون على مستوى عال من للتحمل واللياقة	☐	☐
١٣-	☐	☐	بعض الناس يشعرون بالحرج من اجسامهم عند ارتداء الملابس القليلة	ولكن	اخرون لا يشعرون بالحرج من اجسامهم عند ارتداء الملابس القليلة	☐	☐
١٤-	☐	☐	في المواقف التى تتطلب القوة بعض الناس يكونون اول من يتقدم	ولكن	في المواقف التى تتطلب القوة البعض يكون ضمن اخر من يتقدم	☐	☐
١٥-	☐	☐	فيما يتعلق بذاتهم الجسمية (نظرة الفرد لجسمه) بعض الناس لا يشعرون بالثقة الزائدة	ولكن	اخرون يبدو ان لديهم ثقة حقيقية فيما يتعلق بذاتهم الجسمية	☐	☐
١٦-	☐	☐	بعض الناس يشعرون بانهم ضمن الافضل عند مشاركتهم في الانشطة الرياضية	ولكن	اخرون يشعرون بانهم ليسوا ضمن الافضل عند مشاركتهم في الانشطة الرياضية	☐	☐
١٧-	☐	☐	بعض الناس يميلون للشعور بقليل من عدم السهولة عند مزاولة اللياقة والتمرينات	ولكن	اخرون يشعرون بالثقة والسهولة في جميع اوقات مزاولة اللياقة والتمرينات	☐	☐
١٨-	☐	☐	بعض الناس يشعرون دائما باعجاب الاخرين بسبب اجسامهم وقوامهم الجذاب	ولكن	اخرون نادرا ما يشعرون باعجاب الآخرين بمظهر اجسامهم	☐	☐
١٩-	☐	☐	بعض الناس يميلون لفقدان الثقة في قوتهم الجسمية	ولكن	اخرون لديهم ثقة زائدة بقوتهم الجسمية	☐	☐
٢٠-	☐	☐	بعض الناس دائما لديهم شعور ايجابي حقيقي بذاتهم الجسمية	ولكن	اخرون احيانا لا يشعرون ايجابيا بذاتهم الجسمية	☐	☐
٢١-	☐	☐	بعض الناس احيانا يكونون ابطا قليلا من الغالبية عند تعلم المهارات الجديدة في المواقف الرياضية	ولكن	اخرون يبدون دائما انهم ضمن الاسرع في تعلم المهارات الرياضية الجديدة	☐	☐
٢٢-	☐	☐	بعض الناس يشعرون بالثقة الزائدة في قدرتهم على المحافظة على انتظام التمرن وحالتهم البدنية	ولكن	اخرون لا يشعرون بالثقة التامة في قدرتهم على المحافظة على انتظام التمرن وحالتهم البدنية	☐	☐
٢٣-	☐	☐	بعض الناس يشعرون مقارنة مع الاغلبية ان اجسامهم لا تبدو في افضل شكل	ولكن	اخرون يشعرون مقارنة مع الاغلبية ان اجسامهم دائما تبدو في شكل بدني ممتاز	☐	☐
٢٤-	☐	☐	بعض الناس يشعرون بكونهم اقوياء جدا ولديهم عضلات نامية جدا مقارنة مع اغلب الناس	ولكن	اخرون يشعرون بكونهم غير اقوياء جدا وعضلاتهم ليست نامية جدا	☐	☐
٢٥-	☐	☐	بعض الناس يتمنون ان يكون لديهم احترام اكثر لذاتهم الجسمية	ولكن	اخرون دائما لديهم احترام عظيم لذاتهم الجسمية	☐	☐
٢٦-	☐	☐	اذا اتيحت الفرصة، بعض الناس دائما يكونون ضمن اول من يشارك في الانشطة الرياضية	ولكن	اخرون من الناس احيانا يتراجعون ولا يكونون ضمن اول من يشارك في الرياضة	☐	☐

تابع

	ينطبق على تماما	ينطبق على الي حد ما			ينطبق على الي حد ما	ينطبق على تماما
٢٧-	☐	☐	بعض الناس يشعرون مقارنة مع الغالبية بانهم دائما يحافظون على مستوى عال من حالتهم البدنية	ولكن	اخرون يشعرون مقارنة مع الغالبية بان مستوى حالتهم البدنية ليست عالية في غالبية الاحيان	☐	☐
٢٨-	☐	☐	بعض الناس لديهم ثقة زائدة في مظهر اجسامهم	ولكن	اخرون لديهم بعض الخجل من مظهر اجسامهم	☐	☐
٢٩-	☐	☐	بعض الناس يشعرون بانهم ليسوا افضل من الاغلبية عند التعامل مع مواقف تتطلب القوة	ولكن	اخرون يشعرون بانهم ضمن الافضل عند التعامل مع مواقف تتطلب القوة الجسمية	☐	☐
٣٠-	☐	☐	بعض الناس يشعرون برضا زائد عن ذاتهم الجسمية	ولكن	اخرون احيانا يشعرون بقليل من عدم الرضا عن ذاتهم الجسمية	☐	☐

الجزء السابع ..... اهمية الذات الجسمية

	ينطبق علىّ تماما	ينطبق علىّ الي حد ما			ينطبق علىّ الي حد ما	ينطبق علىّ تماما
١ -	☐	☐	بعض الناس يشعرون بان اجادتهم في الرياضة مهمة جدا لهم	ولكن	اخرون يشعرون بان اجادتهم في الرياضة غير مهمة جدا لهم	☐	☐
٢ -	☐	☐	بعض الناس لا يشعرون بان المحافظة على مستوى عال من الحالة البدنية مهمة جدا لهم	ولكن	اخرون يشعرون بان المحافظة على مستوى عال من الحالة البدنية مهمة جدا لهم	☐	☐
٣ -	☐	☐	بعض الناس يعتقدون ان امتلاك شكلا وبناء جسميا جذابا مهم جدا لهم	ولكن	اخرون يعتقدون ان امتلاك شكلا وبناء جسميا جذابا ليس بذات الاهمية في حياتهم	☐	☐
٤ -	☐	☐	بعض الناس يعتقدون ان كونهم اقوياء بدنيا غير مهم جدا لهم	ولكن	اخرون يشعرون بانه من المهم جدا بالنسبة لهم بان يكونوا اقوياء بدنيا	☐	☐
٥ -	☐	☐	بعض الناس يشعرون بان امتلاك قدرات ومهارات رياضية جيدة ليس مهما جدا لهم	ولكن	اخرون يشعرون بان امتلاك مستوى عال من القدرات الرياضية حقيقة مهمة لهم	☐	☐
٦ -	☐	☐	بعض الناس يشعرون بان المحافظة على التمرن بانتظام وعنف مهم جدا لهم	ولكن	اخرون يشعرون بان الاستمرار في التمرن بانتظام وعنف ليس بذات الاهمية بالنسبة لهم	☐	☐
٧ -	☐	☐	بعض الناس لا يشعرون بانه من المهم جدا بالنسبة لهم قضاء الكثير من الوقت والجهد للمحافظة على جسم جذاب	ولكن	اخرون يعتقدون بانه من المهم جدا لهم ان يقضوا الوقت والجهد للمحافظة على جسم جذاب	☐	☐
٨ -	☐	☐	بعض الناس يشعرون بان كونهم اقوياء مع امتلاك عضلات نامية جدا وذات نغمة مهم جدا لهم	ولكن	اخرون يشعرون بان كونهم اقوياء مع امتلاك عضلات نامية جدا وذات نغمة ليس مهما جدا لهم	☐	☐

QUESTIONNAIRE BOOKLET FOR MEN

QUESTIONNAIRE CONTENT

Section I: General information

Section II: Silhouette choice

Section III: Weight related questionnaire

SECTION I

General Information

1. Age _____ years

2. Occupation _____

3. Marital Status
   a. Single
   b. Married
   c. Separated
   d. Divorced
   e. Widowed

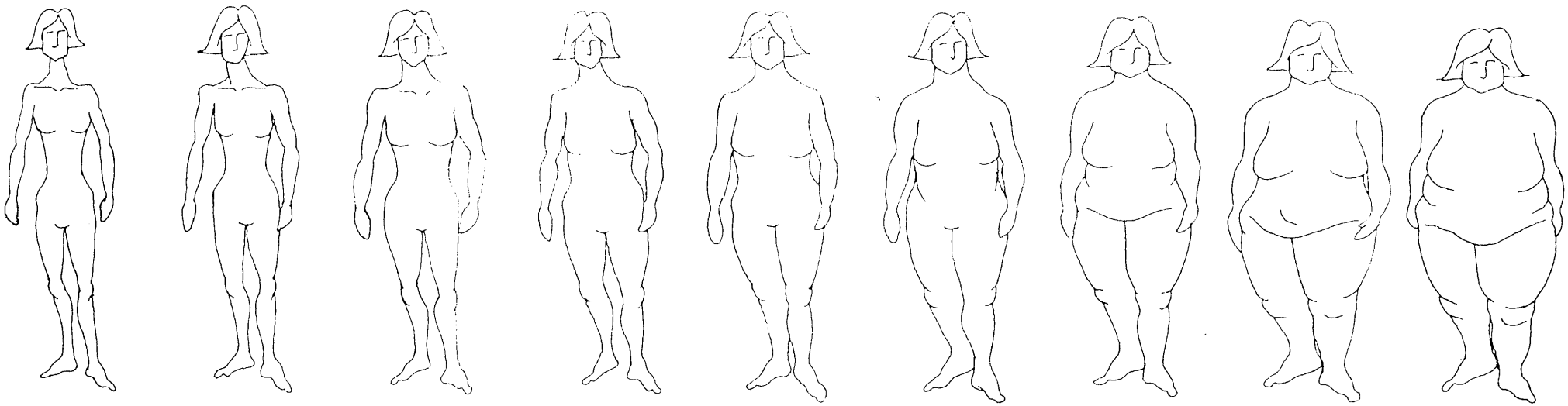
4. Educational Status
   a. none
   b. elementary
   c. intermediate
   d. secondary
   e. higher education

5. If you pick e in Question 4; what was the highest qualification obtained?

_____

SECTION II

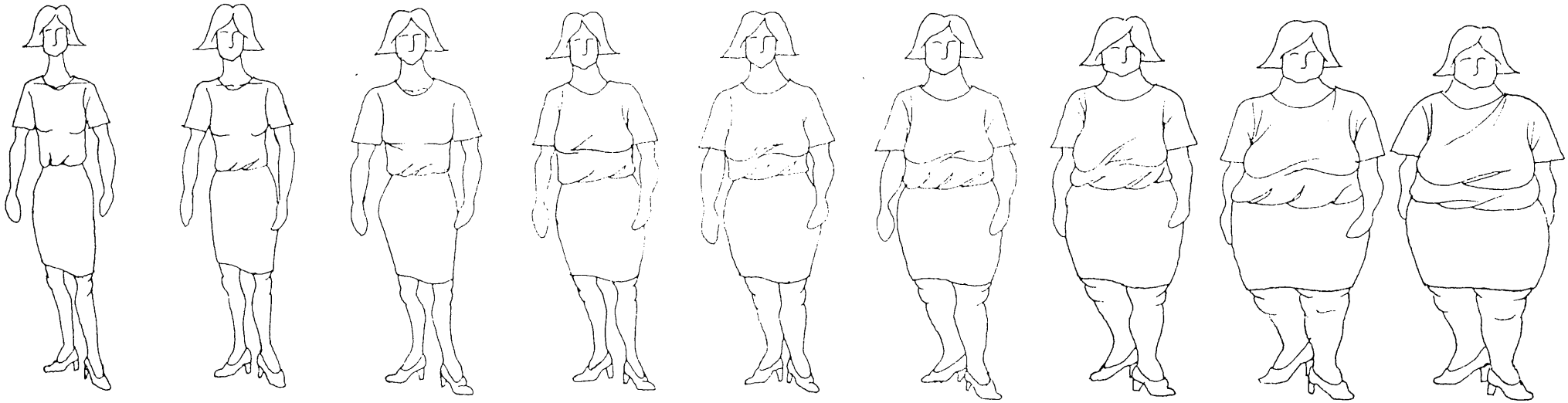
The following pages contain three sheets of women's silhouettes, please answer the questions below each sheet.



1 2 3 4 5 6 7 8 9

Question 1: Which figure most nearly represents that of your wife/partner.
Pick a number from the above list._____

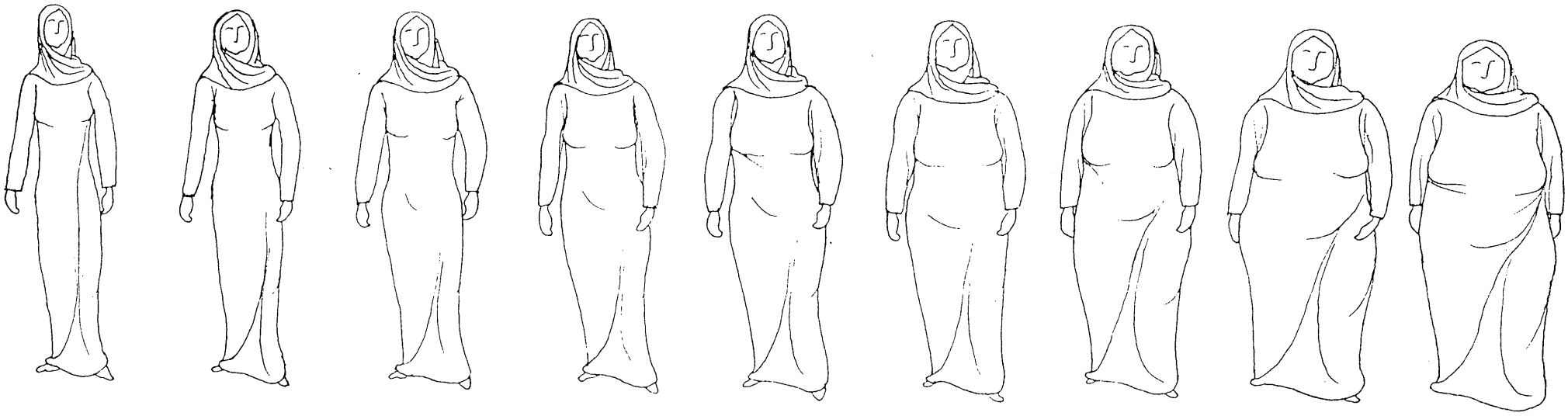
Question 2: Which figure is closest to the figure of your "ideal woman".
Pick a number from the above list._____



1 2 3 4 5 6 7 8 9

Question 1: Which figure most nearly represents that of your wife/partner.
Pick a number from the above list_____

Question 2: Which figure is closest to the figure of your "ideal woman".
Pick a number from the above list_____



1 2 3 4 5 6 7 8 9

Question 1: Which figure most nearly represents that of your wife/partner.
Pick a number from the above list _____

Question 2: Which figure is closest to the figure of your "ideal woman".
Pick a number from the above list _____

Please turn the page and answer the remaining questions.

SECTION III

Question 1: How tall should your "ideal woman" be?

_____

Question 2: What is the ideal weight for your "ideal woman"?

_____

Question 3: How tall is your wife/partner?

_____

Question 4: How much does your wife/partner weigh?

_____

Question 5: How would you describe the body of your "ideal Woman"?
Please choose from the following.

a. A fat body
b. A combination of muscular and fat body
c. A muscular body
d. A combination of muscular and thin body
e. A thin body
f. Other, please specify_____

استبيان بحث

العلاقات بين مكونات الجسم وصورة الجسم وتقدير الذات عند النساء البحرينيات

(استبيان الرجال)

اعـــــداد

منى الانصارى

اخصائية الانشطة النسائية
معهد البحرين الرياضي
المؤسسة العامة للشباب والرياضة
دولة البحرين

الاستبيان ضمن متطلبات الحصول على درجة الدكتوراه
١٩٩٣م

عزيزي المستفتى

تحتوى الصفحات التالية على بعض الاسئلة المتعلقة بمواصفات جسم المرأة... ، بغرض الوصول إلى تحليل دقيق للتكوين البدني والنفسي للمرأة البحرينية وذلك تمهيداً لوضع عدد من التوصيات والمشروعات التى يؤمل منها تحقيق الفائدة لنساء البحرين. برجاء التكرم بقراءة التعليمات بدقة والاجابة عن الاسئلة بدقة. مع ملاحظة ان جميع المعلومات والبيانات التى سوف تتفضل بذكرها ستكون سرية ولاغراض البحث العلمي فقط.

ولا شك ان ما سوف تدلى به من معلومات سيكون له عظيم الأثر على نتائج هذا البحث.

ملاحظة :

بالنسبة للرجال المتزوجين تتم الاجابات في إطار الرأى حول الزوجة

وبالنسبة لغير المتزوجين تكون الاجابات في إطار ما يراه في زوجة المستقبل.

الرجاء الأجابة على جميع الأسئلة دون استثناء

الجزء الأول ..... البيانات العامة

برجاء استيفاء البيانات المطلوبة ، ووضع علامة (×) أمام ما يناسبك :

١ - العمر : ..... سنة

٢ - الوظيفة : .....

٣ - الحالة الزواجية :

أ - أعزب ..... ☐
ب - متزوج ..... ☐
جـ - منفصل ..... ☐
د - مطلق ..... ☐
هـ - أرمل ..... ☐

٤ - المستوى التعليمي :

أ - غير متعلم ..... ☐
ب - ابتدائي ..... ☐
جـ - اعدادي ..... ☐
د - ثانوي ..... ☐
هـ - تعليم عال ..... ☐

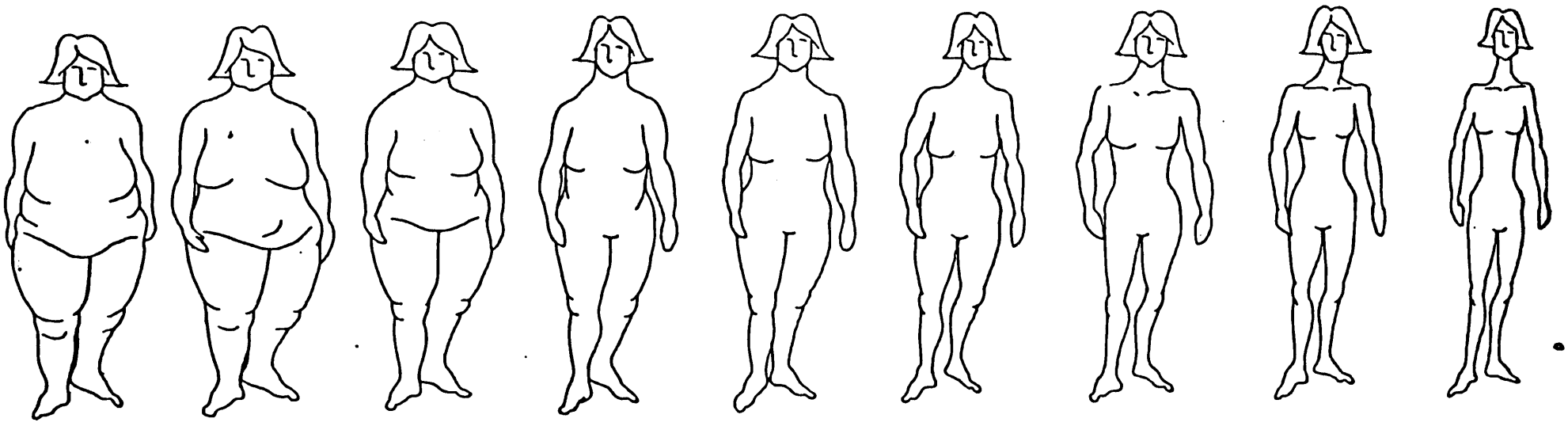
٥ - برجاء تدوين آخر شهادة حصلت عليها .....

.....

الجزء الثاني ..... صورة جسم المرأة

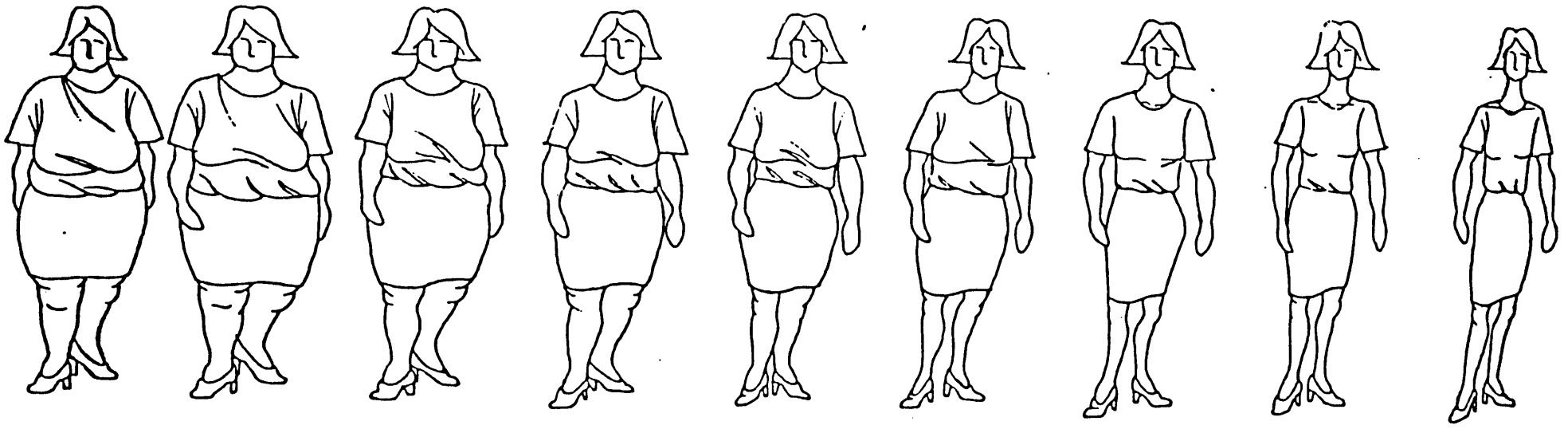
تتضمن الصفحات التالية بعض الاشكال المعبرة عن صورة جسم المرأة.

برجاء التكرم بفحص هذه الاشكال بدقة والاجابة على الاسئلة الواردة اسفل كل صفحة.



١ - اكتب رقم اقرب شكل من هذه الاشكال لجسم زوجتك ؟ _____

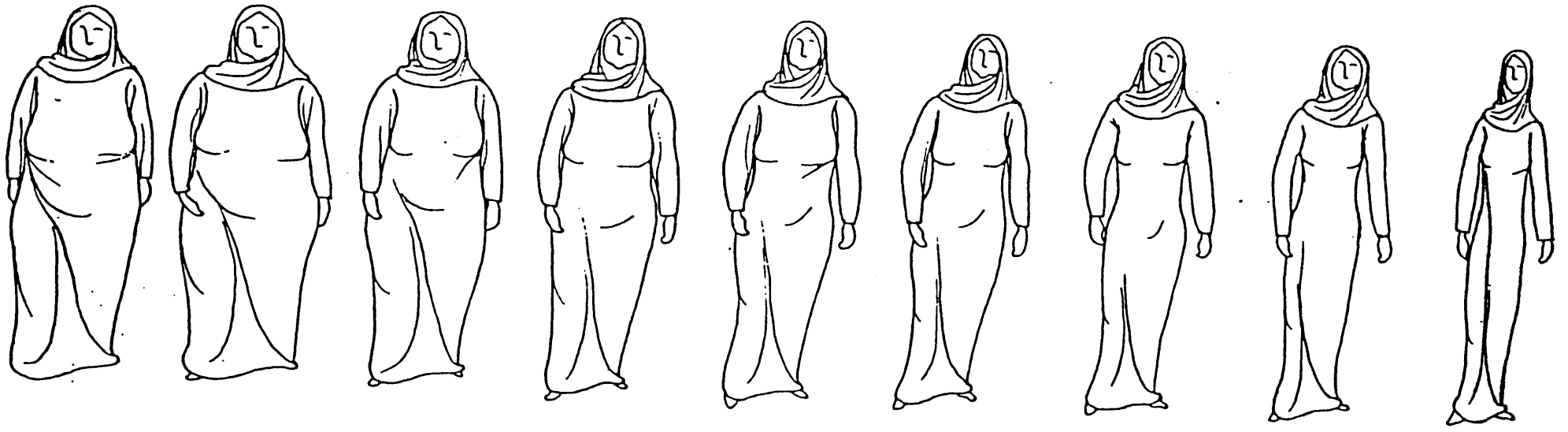
٢ - اكتب رقم الشكل الذى ترى فيه الجسم المثالي للمرأة ؟ _____



٩ ٨ ٧ ٦ ٥ ٤ ٣ ٢ ١

١ - اكتب رقم اقرب شكل من هذه الاشكال لجسم زوجتك ؟ _____

٢ - اكتب رقم الشكل الذى ترى فيه الجسم المثالي للمرأة ؟ _____



١- اكتب رقم اقرب شكل من هذه الاشكال لجسم زوجتك ؟ _____

٢- اكتب رقم الشكل الذى ترى فيه الجسم المثالي للمرأة ؟ _____

الجزء الثالث ..... طول ووزن ونمط جسم المرأة

برجاء الاجابة عن الاسئلة التالية .... ووضع علامة (×) امام الاجابة المناسبة

١ - ما هو الطول المثالي للمرأة في رأيك ؟ ..... ———— سم/ قدم.

٢ - ما هو الوزن المثالي للمرأة في رأيك ؟ ..... ———— كجم/ رطل.

٣ - ما هو طول زوجتك في تقديرك ؟ ..... ———— سم/ قدم .

٤ - ما هو وزن زوجتك تقريبا ؟ ..... ———— كجم/ رطل.

٥ - ما هو الوصف الذى ينطبق عليه الجسم المثالي للمرأة في رأيك :

أ - سمين ..... ☐

ب - يجمع بين العضلية والسمنة ..... ☐

جـ - عضلى ..... ☐

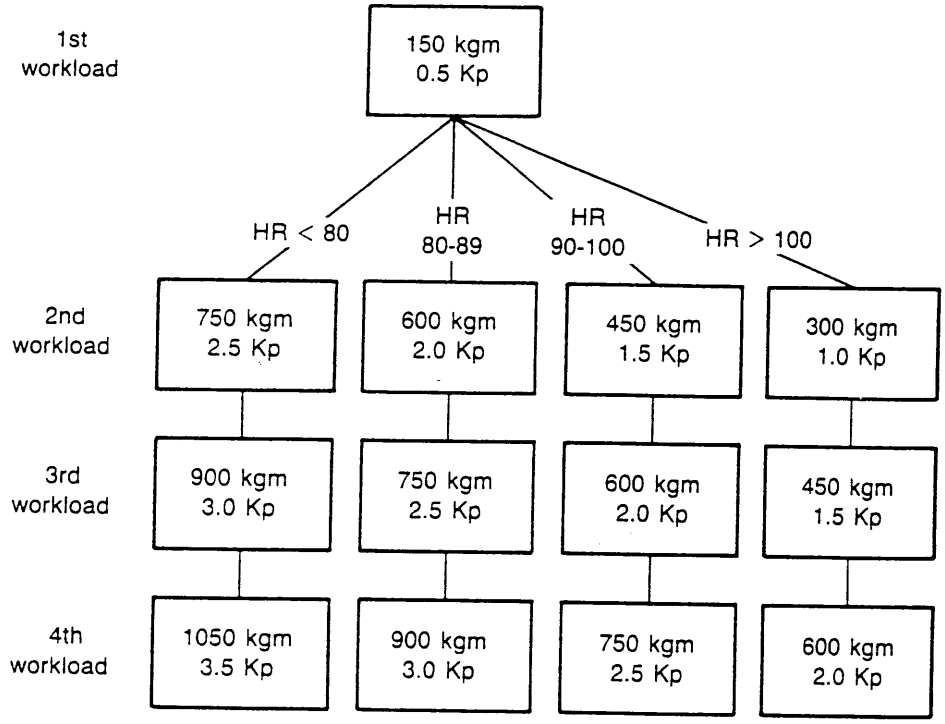
د - يجمع بين العضلية والنحافة ..... ☐

هـ - نحيف ..... ☐

و - وصف أخر تراه : ..... ☐

الرجاء التحديد .....

APPENDIX II



Directions:

1. Set the first workload at 150 kgm/min (0.5 Kp).
2. If the HR in the third min is
   - less than (<) 80, set the second load at 750 kgm (2.5 Kp);
   - 80 to 89, set the second load at 600 kgm (2.0 Kp);
   - 90 to 100, set the second load at 450 kgm (1.5 Kp);
   - greater than (>) 100, set the second load at 300 kgm (1.0 Kp).
3. Set the third and fourth (if required) loads according to the loads in the columns below the second loads.

Guide to setting workloads on bicycle ergometer.

Y's Way to Physical Fitness

SCORE SHEET—WOMEN

NAME _____ DATE _____

TIME _____

Age _____ years Weight _____ lb _____ kg Height _____ in.

Resting Blood Pressure _____/_____ mm Hg Resting Heart Rate _____ bpm

---

1. SKINFOLDS

Chest	_____	mm
Abdomen	_____	mm
Ilium	_____	mm
Axilla	_____	mm
Scapula	_____	mm
Tricep	_____	mm
Thigh	_____	mm

2. PERCENT FAT

	Sum of 4		Sum of 3
Abdomen	_____	Abdomen	_____
Ilium	_____	Ilium	_____
Tricep	_____	Tricep	_____
Thigh	_____	**Sum**	_____
Sum	_____		
Percent fat	_____ %	Percent fat	_____ %

3. TARGET WEIGHT (23% fat) _____ lb

4. PHYSICAL WORK CAPACITY TEST

Seat Height _____ Predicted Max Heart Rate _____ bpm

85% of Predicted Max Heart Rate _____ bpm _____ Seconds for 30 Beats

WORKLOADS	HEART RATES
1st Workload 150 kgm	_____ 2nd min
	_____ 3rd min
	_____ 4th min (if needed)
2nd Workload _____ kgm	_____ 2nd min
	_____ 3rd min
	_____ 4th min (if needed)
3rd Workload _____ kgm	_____ 2nd min
	_____ 3rd min
	_____ 4th min (if needed)

Transfer above results to the PWC graph and compute.

5. FLEXIBILITY

Trunk Flexion _____ in.

6. MUSCULAR STRENGTH & ENDURANCE

Bench Press (35 lb) _____ reps

1-Minute Timed Sit-Ups _____ reps

Transfer results to the Physical Fitness Evaluation Profile and the Body Composition Profile.

MAXIMUM PHYSICAL WORKING CAPACITY PREDICTION

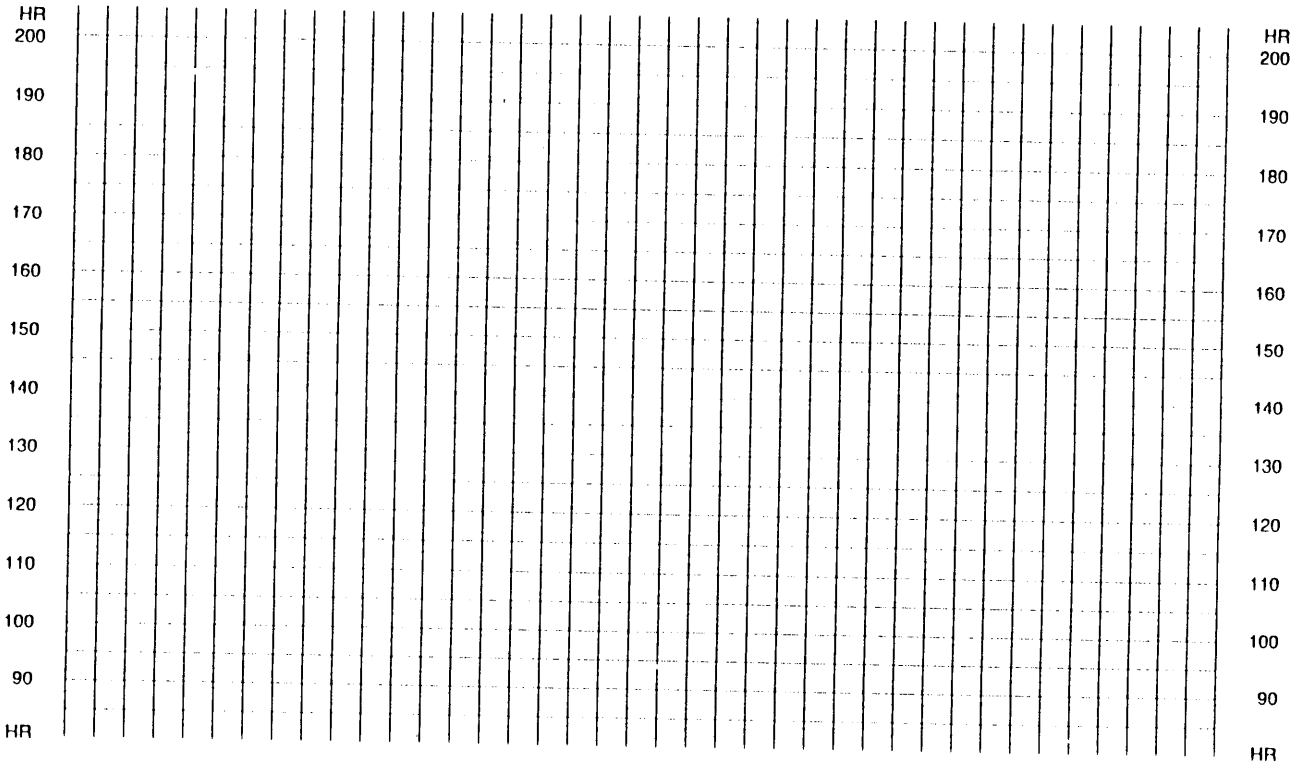
NAME _____ AGE _____ WEIGHT _____ LB _____ KG SEAT HEIGHT _____

PREDICTED MAX HR _____

	DATE	1st WORKLOAD HR USED	2nd WORKLOAD HR USED	MAX WORKLOAD	MAX O_2(L/min)	MAX O_2(mL/kg)
TEST 1						
TEST 2						
TEST 3						

DIRECTIONS

1. Plot the HR of the 2 workloads versus the work (kgm/min).
2. Determine the subject's max HR line by subtracting subject's age from 220 and draw a line across the graph at this value.
3. Draw a line through both points and extend to the max HR line for age.
4. Drop a line from this point to the baseline and read the predicted max workload and O_2 uptake.



WORKLOAD (kgm/min)	150	300	450	600	750	900	1050	1200	1350	1500	1650	1800	1950	2100
MAX O_2 UPTAKE (L/m)	0.6	0.9	1.2	1.5	1.8	2.1	2.4	2.8	3.2	3.5	3.8	4.2	4.6	5.0
KCAL USED (kcal/m)	3.0	4.5	6.0	7.5	9.0	10.5	12.0	14.0	16.0	17.5	19.0	21.0	23.0	25.0
APPROX MET LEVEL (for 132 lb)	3.3	4.7	6.0	7.3	8.7	10.0	11.3	12.7	14.0	15.3	16.7	18.0	19.3	20.7
APPROX MET LEVEL (for 176 lb)	3.0	4.0	5.0	6.0	7.0	8.0	9.0	10.0	11.0	12.0	13.0	14.0	15.0	16.0

Form for plotting maximum physical working capacity prediction.

APPENDIX III

Measurement sites:

1. Neck girth: A tape is placed on a position just inferior to the laryngeal prominence (Adam's apple)
2. Biceps girth: Maximum girth over the belly of the biceps muscle with the arm extended and the muscles contracted
3. Chest girth: At the level of the nipple after a normal expiration
4. Waist girth: The narrowest part of the torso after a normal expiration
5. Abdomen girth: At the level of the umbilicus at the end of a normal expiration
6. Hips girth: At the level of the maximum extension of the buttocks
7. Thigh girth: At the point midway between hip and knee joint
8. Calf girth: At the of the maximum circumference of the calf
9. Triceps skinfold: A vertical fold over the triceps muscles at a point midway between the acromion (the shoulder) and olecranon processes (the elbow), with the elbow extended and relaxed
10. Biceps skinfold: A vertical fold over the biceps muscle of the arm, at the same level where the biceps girth was taken
11. Subscapular skinfold: A diagonal fold following the natural cleavage lines of the skin, at a point slightly inferior to the inferior angle of the scapula
12. Suprailiac skinfold (Durnin & Womersley 1974): A horisontal fold at the midaxillary line (the side of the body) just obove the crest
13. Suprailliac skinfold (Jackson et al 1980): A diagonal fold above the crest following the natural cleavage of the skin at a point located at the anterior axillary line (slightly towards the torso)
14. Abdomen skinfold: A vertical fold taken at a point 2 cm lateral to the umbilicus (it is prefered if the subjects hold her breath after a normal expiration to minimize the movement of the abdomenal wall)
15. Thigh skinfold: A vertical fold at the same site of the thigh girth
16. Calf girth: A vertical fold at the same site of calf girth.

APPENDIX IV

APPENDIX IV

1. Table 32: Correlation coefficients between percentage body fat calculated by (1) the formula of Durnin
and womersley (1974), (2) the formula of Jackson et al (1980), and body composition measurements

2. Table 33 Correlation coefficients between educational status of the younger women and some of their body composition measurements

3. Table 34 Correlation coefficients between global self-esteem of the older women and some items of their body cathexis scale

4. Table 35 Correlation coefficient between some of the PSPP items and some of the BCS items for the older and younger Bahraini women

5. Table 36 Correlation coefficients between educational status of the 106 Bahraini
males and their choice of their ideal female figure

6. Table 37 Correlation coefficients between age and body fat: exercising sample

7. Table 38 Correlation coefficients between global self-esteem, body condition (PSPP)
and some of the body composition variables: exercising sample (pre-measurements)

8. Table 39 Correlation coefficients between changes in perception of current figures
and some of the body composition variables (exercising group)

Table 32

Correlation coefficients between percentage body fat calculated by (1) the formula of Durnin and womersley (1974), (2) the formula of Jackson et al (1980), and body composition measurements

VARIABLES	% BODY FAT 1		% BODY FAT 2	
	YOUNGER	OLDER	YOUNGER	OLDER
% Body fat 1[a]	1.00	1.00	0.95***	0.89***
% Body fat 2[b]	0.95***	0.89***	1.00	1.00
Weight (kg)	0.85***	0.75***	0.84***	0.84***
Height (cm)	0.00	0.14	0.10	0.10
Body Mass Index ($kg.m^{-2}$)	0.84***	0.78***	0.79***	0.87***
Abdomen skf (mm)	0.86***	0.80***	0.91***	0.88***
Abdomen girth (cm)	0.85***	0.79***	0.82***	0.83***
Biceps skf (mm)	0.84***	0.68***	0.82***	0.75***
Biceps girth (cm)	0.88***	0.81***	0.83***	0.87***
Bust girth (cm)	0.78***	0.82***	0.76***	0.86***
Calf skf (mm)	0.75***	0.66***	0.83***	0.77***
Calf girth (cm)	0.75***	0.62***	0.79***	0.76***
Hips girth (cm)	0.81***	0.77***	0.84***	0.84***
Neck girth (cm)	0.66***	0.40*	0.60***	0.47**
Subscapular skf (mm)	0.83***	0.84***	0.73***	0.75***
Suprailiac skf 1 (mm)[c]	0.93***	0.87***	0.89***	0.76***
Suprailiac skf 2 (mm)[d]	0.90***	0.80***	0.92***	0.92***
Thigh skf (mm)	0.80***	0.79***	0.89***	0.93***
Thigh girth (cm)	0.84***	0.79***	0.87***	0.90***
Triceps skf (mm)	0.92***	0.83***	0.91***	0.90***
Waist girth (cm)	0.85***	0.76***	0.78***	0.77***

[a] percentage body fat calculated by Durnin and Womersley's formula (1974); [b] percentage body fat calculated by Jackson et al's formula (1980); [c] suprailiac skinfold measured as described by Durnin and Womersley (1974); [d] suprailiac skinfold measured as described by Jackson et al (1980).

* $P < 0.05$, ** $P < 0.01$; *** $P < 0.001$.

Table 33

Correlation coefficients between educational status of the younger women and some of their body composition measurements

Variables	% Body fat	BMI	Body mass
Educational status	- 0.22*	- 0.18*	- 0.19*

* P values are not statistically significant

Table 34

Correlation coefficients between global self-esteem of the older women and some items of their body cathexis scale

Variables	Hair	Hand	Eyes	Resistance to illness
Self-esteem	0.42*	0.56**	0.36*	0.47**

* $P < 0.05$, ** $P < 0.01$

Table 35

Correlation coefficient between some of the PSPP items and some of the BCS items for the older and younger Bahraini women

	PSPP					
	Physical self worth		Physical condition		Physical strength	
BCS	Younger	Older	Younger	Older	Younger	Older
Muscular strength	N.S	N.S	N.S	N.S	0.49**	0.52**
Physical skill	N.S	0.53**	0.51**	0.53**	N.S	N.S
Physical stamina	N.S	0.48**	N.S	0.40*	0.47**	N.S

* P < 0.05, ** P < 0.01.

Table 36

Correlation coefficients between educational status of the 106 Bahraini males and their choice of their ideal female figure

Variables	Ideal female (nude)	Ideal female (Western)	Ideal female (Islamic)
Educational status	- 0.19*	- 0.21**	- 0.19*

* P = 0.05, ** P < 0.05.

Table 37

Correlation coefficients between age and body fat: exercising sample

Variables	Age
% body fat	0.42*

* P < 0.05.

Table 38

Correlation coefficients between global self-esteem, body condition (PSPP) and some of the body composition variables: exercising sample (pre-measurements)

Variables	Body mass	FFM	Bust girth	Calf girth	Thigh girth	Subscapular skinfold	Suprailiac skinfold
Self-esteem	- 0.48*	- 0.55**	- 0.49*	- 0.46*	- 0.42*	N.S	N.S
Physical condition	N.S	N.S	N.S	N.S	N.S	- 0.43*	- 0.49*

* P < 0.05, ** P < 0.01.

Table 39

Correlation coefficients between changes in perception of current figures and some of the body composition variables (exercising group)

Changes with exercise	Nude current figure	Western current figure	Islamic current figure
Body mass	0.67***	0.48*	0.43*
% body fat	0.47*	0.40*	N.S
BMI	0.66***	0.47*	0.43*
Fat mass	0.67***	0.54**	0.44*
Fat free mass	0.53**	N.S	N.S
Neck girth	0.54**	N.S	N.S
Biceps girth	0.67***	0.47*	0.52**
Bust girth	0.60**	0.58**	0.44*
Waist girth	0.41*	N.S	N.S
Hips girth	0.66***	N.S	0.40*
Thigh girth	0.45*	N.S	N.S
Biceps skinfold	N.S	0.42*	N.S
Triceps skinfold	0.48*	N.S	0.42*
abdomen skinfold	0.43*	N.S	N.S
Thigh skinfold	0.40*	N.S	0.46*

* P< 0.05, ** P < 0.01, *** P < 0.001.