



# **Effectiveness of Educational program on Female students Knowledge regarding increase Testosterone level in women**

A project submitted to the college of nursing in partial fulfillment to the degree of  
B.Sc. in Nursing

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## الآية القرآنية

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ



صلى الله العظيم

## الإهداء

الحمد لله والشكر لله سبحانه وتعالى، والصلاة والسلام على من بلغ الرسالة وأدى الأمانة  
ونصح الأمة إلى نبي الرحمة ونور العالمين سيد الخلق أجمعين نبينا محمد صل الله عليه  
وعلى آله الطيبين الطاهرين

إذا كان الإهداء يعبر ولو بجزء من الوفاء, فالإهداء.....

إلى معلم البشرية ومنبع العلم... سيدنا ونبينا محمد صل الله عليه وعلى آله وصحبه

إلى من أرواحهم ودمائهم عطرت أرض الوطن... الشهداء الأبطال

إلى رمز الرجولة والتضحية إلى من دفعني إلى العلم و به أزداد افتخار... أبي العزيز

إلى من وضع المولى -سبحانه وتعالى -الجنة تحت قدميها , ووفرها في كتابه العزيز... أمي

إلى القلوب الطاهرة الرقيقة والنفوس البريئة الى رياحين حياتي... إخواني وأخواتي

إلى من تحلو بهم دروب الحياة إلى الإخوة اللذين لم تلههم أمي... أصدقائي

إلى جميع أساتذتي الكرام في كلية التمريض / جامعة بصره أهديكم بحثي

، وأتمنى أن ينال رضاكم ....

## ***Supervisor's Stupor***

**I certify that this project of research**

### **Effectiveness of Educational program on Female students Knowledge regarding increase Testosterone level in women**

Was prepared under my supervision at the College of Nursing, University of Basrah as partial fulfillment of the requirements for the degree of baccalaureate in Nursing .sciences

**Assist.Prof. Zainab Aleg Hasan**

***Supervised***

***College of Nursing***

***University of Basrah***

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## **Abstract**

### **Backgrou**

Sex testosterone hormones are mostly known for their role in the development of sex organs and physical maturation during puberty. Testosterone is the most important circulating and naturally occurring androgen in both men and women. In women, testosterone is produced primarily through peripheral conversion of androstenedione (50 percent) with the remainder of production concentrated in the ovary (25 percent) .and adrenal cortex (25 percent)

### **Objective of the study**

To assess the Effectiveness of the educational program on .the female students knowledge about increase testosterone level

### **Methodology and materials**

Descriptive cross-sectional design study of nursing ,Medical Sciences and Faculties of humanity students' knowledge about Effectiveness of Educational program on Female students Knowledge regarding increase Testosterone level in women, started from 14 . November 2021 until 13 April 2022 in order to complete study

The study was collected at the college of Nursing /University of Basrah . The simple (69) was collected according to (adult 20 yours and .( above , students who select second , third , forth , female student only

The question consists two parts, the first part consists of socio demographics characteristics . The second part consists of 20 questions . about knowledge of students increasing testosterone

### **The result of the study**

The result of the study show very good efforts of the educational program providing the participants good knowledge represented by the percent (**98.6%**) comparing the percent of (**39.1%**) before application of . educational program

### **Conclusion**

Based on the result obtained from the data analysis , which concluded that there is poor knowledge of students before the application of educational program . while there is very good knowledge after application educational program .According to this result ,the educational program achieved the goal.

### **Recommendatio**

Dissemination of awareness advertisements to clarify the dangers of high .testosterone in Women

Introducing the topic of hormonal disorders in women including .testosterone into the school curricula

.Conducting an extensive study by taking larger community samples

.Maintaining weight, healthy eating and doing physical exercises

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## List of abbreviation

<b><i>ASC</i></b>	<b><i>Autism spectrum conditions</i></b>
<b><i>CT</i></b>	<b><i>Computer Tomography scan</i></b>
<b><i>DHEA</i></b>	<b><i>Dehydroepiandrosterone sulfat</i></b>
<b><i>DHT</i></b>	<b><i>Dehydroepiandrosterone</i></b>
<b><i>LT</i></b>	<b><i>Luteinizing hormone</i></b>
<b><i>MRI</i></b>	<b><i>Magnetic resonance imaging</i></b>
<b><i>PCOS</i></b>	<b><i>Polycystic ovary syndrome</i></b>
<b><i>RCT</i></b>	<b><i>Randomized controlled trial</i></b>
<b><i>SSEs</i></b>	<b><i>Supplemental special education services</i></b>

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# **Chapter one**

## **Introduction.1.1**

Sex testosterone hormones are mostly known for their role in the development of sex organs and physical maturation during puberty . Research on the effects of testosterone has brought many interesting findings that have radically changed and broaden the view of testosterone as a hormonal regulator of development. Animal experiments and human studies illustrate how testosterone influences putative unrelated features like morphological characteristics and cognitive abilities or intelligence .(Martin *et al.* 2009, Hodosy. *et al.* 2010)

The basic physiology of testosterone influencing not only morphological features but also cognition, emotions and behavior with respect to the underlying molecular mechanisms. The contribution of sex steroids to organizing structural and functional connections in the human brain is discussed, both during the prenatal period as well as during other period characterized by massive sex steroid changes such as puberty. The prenatal period is a critical time for sex steroids to shape the brain , but also for the development of the phalanges . This is the reason why the length of the fourth digit (ring finger) is thought to be an index of prenatal testosterone exposure relative to the length of the second digit (index finger) the marker of prenatal estrogen level. According to several studies, 2D/4D ratio reflects hormonal background in uterus and is useful as a parameter to estimate early testosterone exposure. .( Manning and )Fink 2008, Bull *et al.*, 2010

All behavioral traits, specific cognitive abilities of an individual are the result of a cooperation of hormonal, genetic and environmental factors. There are several known genetic variants modulating testosterone action and its final effect on target tissue . Several studies concerning genetic regulation of androgen activity are discussed in term of modulating final androgen activity . Testosterone is known to have a number of important regulatory roles in adults, and its decline observed during aging may adversely affect physical health and functioning via . gains in fat and losses in lean (muscle) mass (Kaufman JM .*et al.*,2005)

An evidence-based understanding of the changes in testosterone that occur with aging and the consequences of these changes—is important, given recent trends in testosterone prescribing; among men in the UK and USA, there has been an almost twofold and threefold increase in testosterone prescription from 2001 to 2011, respectively (Kuk JL, *et al.*,

Baillargeon J, *et al.*, 2013, Gan EH, *et al.*, 2010, Haggarty *et al.*, 2009, (2010)

Experimental studies have shown that testosterone supplementation in men with low testosterone concentrations leads to gains in muscle and losses in fat mass (Giannoulis MG. *et al.*, 2012, Saad F, *et al.*, 2012). Conversely, diet or bariatric surgery induced weight loss reverses the pathological suppression of testosterone levels in overweight/obese men, suggesting a bidirectional relationship between testosterone and fat mass. In contrast to these effects in men, rare reports of women undergoing sex change therapy suggest that testosterone supplementation may increase visceral fat mass. However, randomized trial evidence is limited to interventions over 1-3 years in a small number of men with testosterone deficiency. Thus, important questions remain as to the longer term influence of testosterone for aging men and women (Corona G, *et al.*, 2013)

Observational studies offer the advantage of studying differences in body composition in large numbers of subjects with wide variations in testosterone levels, within individuals over long intervals. However, previous observational studies have mostly been cross-sectional, usually only of men, and yielded inconsistent results. To the authors' knowledge, this is the first study to prospectively examine the associations between testosterone over a 10-year period with fat mass, fat distribution, and lean mass in late midlife simultaneously in both men and women. We hypothesized that testosterone has a sexually dimorphic effect on fat but a monomorphic effect on lean mass, so that decline in testosterone would be associated with higher fat mass in men but lower fat mass in women and lower lean mass in both sexes. (O'Connell MDL, *et al.*, 2011)

Testosterone is the most important circulating and naturally occurring androgen in both men and women. In women, testosterone is produced primarily through peripheral conversion of androstenedione (50 percent) with the remainder of production concentrated in the ovary (25 percent) and adrenal cortex (25 percent). During pregnancy, the placenta may also serve as a source of the hormone. In women, abnormally high levels of testosterone have been associated with hirsutism and polycystic ovary syndrome. Hirsutism is a consequence of increased production of testosterone or testosterone precursors (dehydroepiandrosterone, 3 $\alpha$ -androstenediol, or androst-4-ene-3,17-dione (3)) and depression of sex hormone binding globulin. Circulating levels of free to total testosterone

in hirsute women are double those of nonhirsute women . Polycystic ovary syndrome is related to ovulatory dysfunction and is a common . cause of female infertility (Speroff L. *et al.*,1994)

Testosterone concentrations have been evaluated for their associations with chronic diseases. Serum levels of testosterone have been suspected in the etiology of breast cancer of postmenopausal women. (Zeleniuch J. *et al.*, 1997) reported an increased risk of breast cancer with increasing concentrations of serum total testosterone (unadjusted  $p$  for trend  $< 0.05$ ). However, this trend was no longer significant after adjustment for total estradiol concentrations and the percent of sex hormone binding globulinbound estradiol. Nonetheless, those authors speculated that testosterone or its metabolites might still play a role in breast cancer etiology by altering the availability of estrogens, by competitively binding with sex hormone binding globulin, and/or by acting as an estrogen precursor. Likewise, androgen concentrations have been associated with insulin levels and diabetes . mellitus (Andersson B, *et al.*,1994)

However, a temporal sequence between higher levels of androgen and increased insulin levels has not been firmly established, as higher androgen concentrations may result in increased insulin resistance or increased insulin production may stimulate androgen production in the ovary (Haffner SM. *Et al.*, 1996 . (Sowers *et al.*, 1996)have reported an association of Osteoarthritis and serum testosterone concentrations in Women aged 25–45 years. Numerous studies have examined factors that influence testosterone concentrations in men, and these may provide an indication of the factors that influence or are associated with testosterone concentrations in women. In men, older age has been consistently associated with declining levels of testosterone (Ben-Aryeth H. *et al.*, . (1989

Lower testosterone concentrations were associated with increased body mass . Smoking was also associated with increased concentrations of serum testosterone in men, whereas alcohol consumption and moderate physical activity do not appear to be associated with variation in testosterone concentrations . Using testosterone concentrations measured at three consecutive annual examinations in a longitudinal study, we describe the factors that are associated with those testosterone levels in pre- and perimenopausal Caucasian women. This is one of the few papers to describe correlates of testosterone concentrations in a population based

study of women and the only one that focuses largely on pre- and perimenopausal women .(Zmuda JM .*et al.*, 1997)

As in men, testosterone production in women follows a circadian rhythm, with higher levels in the morning and a nadir around midnight . Moreover, a modest mid-cycle testosterone peak, coincident with the LH surge in ovulatory cycles, has been confirmed by recent high-sensitivity assays . Apart from this mid-cycle peak, testosterone levels in the . follicular and luteal phases seem to be stable (Bui HN, *et al.*, 2013)

### **:Important of the study .1.2**

Many women around the world suffer from excessive secretion of the hormone androgen, which leads to the appearance of masculine signs on the external appearance of the female, and this has a psychological and physical impact on women, causing some to convert sexually, from female to male. Therefore, many scientific researches are conducted around the world due to the importance of this topic, and we, in turn present a research on the effect of the students' knowledge of an educational program on increasing testosterone in women, which was conducted on 69 female students from different colleges in the Bab Al-Zubair Colleges Complex / University of Basra

### **:Statement of the problem .1.3**

Effectiveness of Educational program on Female students Knowledge . regarding increase Testosterone level in women

### **:Objective of study .1.4**

To assess the Effectiveness of the educational program on .the female students knowledge about increase testosterone level

### **: Definition of study term .1.5**

#### **Effectiveness .1.5.1**

: Theoretical effectiveness

Measure of the extent to which a specific intervention, procedure, regimen, or service, when deployed in the field in routine circumstances, does what it is intended to do for a specified population .(Wojtczak, A. 2002)

:Operational effectiveness

As training that 'meets its objectives as defined by its .funding body

### **The educational programme.1.5.2**

:Theoretical The educational programme

Is the basic unit of classification in ISCED 2011. Each programme should be allocated to a particular level of education on the basis of its educational content, which in practice is determined by applying classification criteria such as typical starting ages, entrance qualifications and type . of qualification awarded (OECD 2015 )

: Operational educational program

Is a program written by the institution or ministry of education which. determines the learning progress of each .subject in all the stages of formal education

### **Testosterone.1.5.3**

: Theoretical testosterone

Hormone produced by the male testis that is responsible for development of the male sex organs and masculine characteristics, including facial hair and deepening of the voice. (H.M. 2017 )

: Operational Testosterone

Is the most important sex hormone in men. More than 95% of the endogenous testosterone is produced in the testes, with mg secreted every day. Testosterone is produced by the 7 –6 Leydig cells in the interstitial compartment in response to .LH binding to its specific Leydig cell membrane receptor

### **knowledge .1.5.4**

: Theoretical knowledge

The fact or condition of knowing something with familiarity gained through experience or association (Merriam 2021)

: Operational Knowledge

Facts, information, and skills acquired by a person through experience or education; the theoretical or practical understanding of a subject



# **Chapter Two**

*Review of literature*

## **:Definition of testosterone .2.1**

Testosterone is a male sex hormone, or androgen, produced in a woman's ovaries in small amounts. Combined with estrogen, the female sex hormone, testosterone helps with the growth, maintenance, and repair of a woman's reproductive tissues, bone mass, and human behaviors.

Testosterone is a powerful hormone in both men and women. It has the ability to control sex drive, regulate sperm production, promote muscle mass, and increase energy. It can even influence human behavior, such as aggression and competitiveness.

## **: Normal Testosterone in women.2.2**

In women, testosterone is produced in the ovaries and adrenal glands. This hormone helps the body with a number of different functions. For example, normal testosterone levels in women help regulate mood and supports the health of female reproductive tissue and bones. Because of this, symptoms can arise if there's a testosterone imbalance and levels get too high or too low. Testosterone can play in a woman's health maintenance and growth of bones and increases muscle mass it can also, decreases body fat (in post-menopausal women) and supports a healthy libido or sex drive, it may help decrease vaginal atrophy (which occurs most often in post-menopausal women) and may help support cardiovascular health. So as you can see, normal testosterone production in females can have many beneficial effects. But too much or too little of this hormone can have less-than-positive effects on the body. (Glaser R. ( and Dimitrakakis C . 2013

## **:Androgen physiology in women.2.3**

Androgens are synthesized in both the adrenals and the ovaries in response to adrenocorticotrophic hormone and luteinizing hormone, respectively. These steroids are also derived from conversion of precursors in peripheral tissues. Until recently the major androgens in the

female circulation were believed to be dehydroepiandrosterone, androstenedione, and testosterone (Burger HG, 2002)

The most potent androgens are produced in peripheral sites (skin, pilosebaceous unit, and adipose tissue) where the enzyme 5 $\alpha$ -reductase acts on steroids arriving via the circulation. Until recently the most significant peripherally derived androgen has been believed to be dihydrotestosterone

Another adrenal steroid, 11 $\beta$ -hydroxyandrostenedione, has for a long time been written off as a by-product of adrenal steroid metabolism and, as such, was seldom even included in the adrenal steroidogenic pathway. Recent studies, however, have revealed that 11 $\beta$ -hydroxyandrostenedione is not a dead-end product of steroid genesis. This C19 steroid serves as the precursor to the androgenic steroid 11 ketotestosterone. When acted upon by 5 $\alpha$  reductase in peripheral tissues, 11 ketotestosterone is converted to 11-ketodihydrotestosterone, which exerts a local effect on androgen receptors comparable with DHT.(Pretorius E ,et al.,2017 , ( Storbeck K-H, et al., 2013

The majority of circulating testosterone is bound to sex hormone binding globulin (66%) and with lower affinity to albumin (33%). The remaining 1% to 2% of testosterone is in a free, unbound state (“free testosterone”). The combination of free testosterone and albumin bound testosterone is also referred to as the “bioavailable” forms of testosterone. In females, this bioavailable testosterone is found in nanomolar to micromolar concentrations.(Rivera-Woll LM at al., 2004 )

Significant androgen action results from the peripheral synthesis of DHT and 11KDHT, which have minimal release into the circulation In premenopausal women, circulating testosterone levels fluctuate during the menstrual cycle, with a peak occurring midcycle. There is also diurnal cyclicality, with rising levels in the early morning. In this population, approximately 25% of circulating testosterone is derived from the ovaries, 25% from the adrenals, and the remaining from peripheral tissue.(Storbeck K-H, et al., 2013 )

Most of the circulating androgens after menopause are of adrenal origin. It is difficult to disentangle the effects of aging and the impact of menopause on circulating androgen levels. Total and free testosterone, androstenedione, and dehydroepiandrosterone all show the most pronounced decline between ages 20 and 45. Androgen levels continue to decline at a slower rate with advancing age and reach a nadir in the early

to mid-60s for total and free testosterone, around 70 years for androstenedione, and in the mid- to late 70s for DHEAS.<sup>6</sup> In menopause and following oophorectomy, circulating testosterone levels are 50% lower than in the early reproductive years. (Davison SL, et al., 2005)

## **2. Signs and symptoms of increase Testosterone level in women**

Testosterone imbalances in women can affect their physical appearance and overall health. Symptoms of high testosterone in women include : Acne ,deep voice , excess hair on the face and body increased muscle mass , irregular periods larger than normal clitoris loss of libido mood changes reduction in breast size thinning hair . Severely high levels of testosterone in women can cause obesity and infertility .When the cause of high testosterone in women is (CAH) the symptoms in women will be: deep voice ,early appearance of pubic hair , enlarged clitoris excess body , hair facial and hair irregular or absent menstrual periods , severe acne short height as an adult but rapid childhood growth (Teede, H., et al., 2003 , Cappola AR, et al., 2007

And when the cause is Hirsutism Which is characterized by unwanted hair growth in women . It is a hormonal condition thought to be linked to genetics. Symptoms include male-pattern hair growth that is dark and coarse. It typically affects the: back ,chest and face . In cases of excessively high testosterone, other symptoms will also be present, including: acne balding, deepening voice and enlarged clitoris and increased muscle mass and reduced breast size. Home remedies and medical treatments help many women control the symptoms of Hirsutism Symptoms of PCOS include: enlarged ovaries that develop follicles and do not release eggs regularly excess body hair irregular, infrequent, or long menstrual periods, PCOS may lead to several complications, including depression heart disease infertility, miscarriage obesity and sleep apnea and type 2 diabetes . (Singh AB, et al., 2006 )

Doctors do not know what causes PCOS, although genetics and excess insulin may play a role

### **2.5. :Causes of increase Testosterone level in women**

High testosterone in women is usually caused by an underlying medical condition, such as

#### **2.5.1. Congenital adrenal hyperplasia (CAH)**

CAH is the term given to a group of inherited disorders that affect the adrenal glands. These glands secrete the hormones cortisol and aldosterone, which play a role in managing metabolism and blood pressure. The adrenal glands also produce the male sex hormones DHEA and testosterone. People with CAH lack one of the enzymes necessary to regulate the production of these hormones, so they secrete too little cortisol and too much testosterone. CAH may be mild (nonclassic CAH) or severe (classic CAH). While there is no cure for CAH, most people with the condition can receive treatment that will reduce symptoms and . improve their quality of life .(Teede, H., *et al.*, 2003)

### **2.5.2. Polycystic ovary syndrome (PCOS)**

PCOS is a common hormonal disorder that affects women of reproductive age. Some sources . Trusted Source suggest that PCOS affects between 8 and 20 percent of women worldwide. Women are not usually diagnosed until they are in their 20s and 30s, but children as . young as 11 years old can be affected.(Teede, H., *et al.*, 2010)

### **2.5. Hirsutism.3**

Hirsutism is a hormonal condition in women that causes growth of unwanted hair, specifically on the back, face, and chest. The amount of body hair growth is highly dependent on genetics, but this condition is primarily caused by an imbalance of androgen hormones. Hirsutism is defined as the presence of excessive terminal hair in androgen-dependent areas of a woman's body. The disorder is a sign of increased androgen action on hair follicles, from increased circulating levels of androgens (endogenous or exogenous) or increased sensitivity of hair follicles to normal levels of circulating androgens. (Melissa H. *et al.*, 2003 )

### **2.6.Nursing Intervention regarding increase**

#### **. Testosterone level in women**

### **2.6. Diagnosis of increase Testosterone level in .1**

#### **.women**

High testosterone levels in women may be diagnosed by blood tests. A health care provider may suspect that you have . high testosterone levels after a physical examination

### **2.6.1. Physical examination.1**

During a physical examination, your health care provider will examine you based on your symptoms, such as body hair, facial hair, excessive hair loss, and acne. Your health care provider may also ask you a series of questions in relation to your menstrual cycle, libido, and mood changes. If your doctor suspects PCOS, they may perform a pelvic ultrasound examination to identify any abnormalities (Piketty ML, *et al.*, 2017 )

#### **Blood test.2.6.1.2**

If your symptoms are indicative of high testosterone levels, your health care provider may take a blood sample to test your hormone levels. Normally, this test is done in the morning when testosterone levels are usually high. They may also test glucose and cholesterol levels. These tests may be vital if she have PCOS or if she menstruation has stopped due to excessive athletic training or anorexia nervosa

#### **Ultrasound.2.6.1.3**

Your health care provider may further recommend an ultrasound to check your ovaries and uterus if they suspect PCOS. If a person is suspected of having an adrenal pathology, they need to be evaluated with either computerized tomography (CT) or MRI

## **Nursing management for increase Testosterone level in .2.6.2 :women**

Women with mild Hirsutism can be treated safely and effectively by most primary care providers after serious etiologies have been excluded. Those with more significant symptoms or life-threatening disease should be referred to specialists. Women with emotional distress regardless of the degree of symptoms often benefit from referral for psychological support

Women with significant acne or Hirsutism that does not respond to standard therapy are often best treated in conjunction with a dermatologist and sometimes a medical or reproductive endocrinologist. Women with signs of virilization should be evaluated by a medical endocrinologist. Likewise, women with significant adrenal disease require the expertise of a medical endocrinologist and possibly a surgeon specializing in adrenal tumors .(Mohammed Y, 2022 )

### **:Treatment of increase Testosterone level in women.2.6.3**

Treatment for high testosterone depends on the cause, but generally includes medication or lifestyle changes. Medications used to treat high testosterone include

**Glucocorticosteroids** : Glucocorticoids are medications that help reduce inflammation in the body, which may be associated with higher levels of the male hormone testosterone in women. (Yuan J, *et al.*, 1998)

**Metformin**: It is a drug used to treat type 2 diabetes, and it is also used in cases of polycystic ovary syndrome, which may lead to an increase in the male hormone in women, as it helps reduce insulin resistance associated with this syndrome. (Javed A, 2016)

**Oral contraceptives** : These medications help prevent excessive production of male hormones. The best types of birth control pills for high testosterone and resulting hair growth are those that contain low doses of norgestimate, desogestrel and gestodene. But it should be noted that these medicines are not suitable for women who want to become pregnant, so you should consult your doctor about the appropriate medicines before taking them. (Danielson, D.A, *et al.*, 1982)

**Spirolactone** : Spirolactone is a diuretic that relieves fluid and salt retention in the body, and can also help reduce excessive hair growth. However, this medicine should not be used in some cases, including a high level of potassium in the body, or problems with urination. Follow your doctor's instructions regarding the dose and how to use this medicine. Spirolactone can cause some side effects, the most important of which are breast enlargement and tenderness. (Layton AM, *et al.*, 2017 )

**Progestin** : This hormone helps regulate the menstrual cycle and improve fertility in women with high levels of the male hormone testosterone. (CIS Information Services , 2000)

Oral contraceptives have been shown as effective treatment for blocking testosterone, but this treatment method will interfere if you have immediate plans to get pregnant. According to research from the American Academy of Family Physicians, low-dose birth control that use low levels of norgestimate, gestodene, and desogestrel are the best choices. All of these medications are only available by prescription. To obtain one, you must meet with your doctor or gynecologist

## **Does testosterone therapy have a role in select cases of .2.7 ? female sexual interest / arousal disorder**

Sexual desire is the result of “a biological drive subject to both endocrine fluctuations and the complex neural activity of the brain.” When this drive is diminished and becomes a distressing element in a relationship, it is considered a key component of female sexual interest/arousal disorder. Despite the inability to detect a low androgen state in women with sexual dysfunction, testosterone supplementation does appear to offer modest therapeutic benefit in properly selected . cases.(Basson R. *et al.*, 2010 , Somboonporn JDS. and Bell RJ.2009 )

In menopausal women, the effectiveness of adding testosterone to standard menopausal hormone therapy in women has been analyzed in two Cochrane reviews. Pooled estimates of 35 studies with 4768 participants demonstrated that postmenopausal women who received testosterone had improved sexual function scores and a slight increase in the number of satisfying sexual episodes (one per month). Both naturally and surgically menopausal women were included in these trials. Discontinuation rates were similar to the group on standard HT alone. The evidence was insufficient to determine a treatment effect in premenopausal and perimenopausal women. Limitations included significant variation in diagnostic criteria and outcome measures. Testosterone replacement therapy is effective in reducing sexual dysfunction post-oophorectomy. A 300 mg/24-hour transdermal testosterone patch increased SSEs by an average of one episode per month compared with the placebo group (baseline number of SSEs was . three per month).(Somboonporn W ,*et al.*,2005 , Buster JE, *et al.*,2005 )

Furthermore, women in the testosterone arm were more likely to report a “meaningful overall benefit,” suggesting that even the modest increase in SSEs was clinically relevant. In reproductive-aged women, the literature on use of testosterone for treatment of sexual disorders is limited to trials with small sample sizes. One of the first studies was a placebocontrolled, crossover design with two double-blind, 12-week treatment periods of either daily application of 1% testosterone cream or identical- appearing placebo cream. Ultimately ,premenopausal women aged 32 to 45 completed the protocol. Testosterone treatment was associated with significant improvements in all sexual parameters measured through validated questionnaires, including sexual interest,



satisfaction with sex life, and orgasm. (Goldstat R, 2003 ,Rees PM, et al., . (2007

Another RCT investigated the effects of three different doses of testosterone transdermal spray in premenopausal women and reported an increase in satisfying sexual activity from baseline. Only the intermediate dose arm (one 90 mL spray of testosterone daily) had a statistically significant increase in the frequency of SSEs compared with placebo. Given the small effect size (one SSE in 1 month) and the significant placebo effect, the authors cautioned that further research is . warranted.(Davis S, *et al.*, 2008)

## **:Prevent excess testosterone in women .2.8**

Hair thinning treatments, which are treatments that help get rid of excess hair caused by high male hormone in women, but it should be noted that these treatments do not address the main problem causing the disease. These treatments can have negative reactions in some people, so always consult your doctor before using them. Hair thinning treatment :options include

- Electrolysis, which includes inserting a small needle into each hair follicle and transferring an electric current to it to damage the follicle so that the hair does not grow again, but the woman may need repeated sessions to obtain satisfactory results. Laser treatment In this treatment, a laser is applied to the hair follicles to destroy them and it takes repeated sessions to achieve the desired . results (Goldstat R, *et al.*,2003)
- Eflornithine: is a cream applied to the skin that helps prevent hair growth on the face but is not used to reduce hair growth on other parts of the body. It should be noted that this cream does not remove pre-existing hair and does not cause hair loss, but rather prevents hair from growing again. (Hardman, J.G. *et al.*, 1996) . ○ Making lifestyle changes as it can help reduce the increase in male hormones in women, and can also help treat some symptoms, and these changes include the following: Maintaining a healthy weight as this helps in treating the hormonal imbalance in the body, as it has been observed that the symptoms of IBS Polycystic ovaries have improved and there has been a decrease in testosterone levels.

The risk of complications such as infertility decreased when affected women lost between 5-10% of their weight. Simple ways to remove unwanted hair. Some women may prefer to remove excess hair caused by high male hormone. This is by removing hair, shaving, or using chemical hair removal machines, and others may prefer bleaching their hair to make it look less noticeable

## **: Previous study.2.9**

### **:First Testosterone in :Women Measurement and Therapeutic Use**

Androgens, both in excessive and depleted states, have been implicated in female reproductive health disorders. As such, serum testosterone measurements are frequently ordered by physicians in cases of sexual dysfunction and in women presenting with Hirsutism

Commercially available androgen assays have significant limitations in the female population. Furthermore, the measurements themselves are not always informative in patient diagnosis, treatment, or prognosis. This article reviews the limitations of serum androgen measurements in women suspected to have elevated or reduced androgen action. Finally, we consider when therapeutic use of androgen replacement may be appropriate for women with sexual interest/arousal disorders.(Ann K. and .( Robert R. 2017

### **. Secondly: Testosterone, cortisol, and women's competition**

Hormone (testosterone, cortisol)–behavior relationships have been extensively studied among male competitors, and far less so among female competitors. To address this gap, (Helen and Douglas) studied members of a nationally recognized college women's rugby team. Seventeen players (ages 18–22 years) provided saliva samples 24 h before, 20 min prior to, and immediately after five league matches. Subjects self-reported aggressiveness, team bonding, pregame mental state, postgame performance evaluation, and whether the opponent was more or less challenging than expected. Results revealed that both testosterone and cortisol levels increased in anticipation of the matches. Postgame levels of both hormones were higher than pregame levels. The pregame rise in testosterone was associated with team bonding, aggressiveness, and being focused, but was unrelated to perceptions of the opponent's skill. Testosterone change during the game was unrelated

to winning or losing, evaluations of personal performance, or perceptions of the opponent's threat. Game changes in cortisol were positively related to player evaluations of whether the opponent was more of a challenge than expected, and negatively related to losing. These results are compared with hormone-behavior patterns found among male competitors and are interpreted within a recent theory of sex differences in response to challenges. (Helen S Bateup, Douglas A Granger, 2002)

**Thirdly: Testosterone shifts the balance between sensitivity for punishment and reward in healthy young women**

Animal research has demonstrated reductions in punishment sensitivity and enhanced reward dependency after testosterone administration. In humans, elevated levels of testosterone have been associated with violent and antisocial behavior. Interestingly, extreme forms of violent and antisocial behavior can be observed in the psychopath. Moreover, it has been argued that reduced punishment sensitivity and heightened reward dependency are crucially involved in the etiology and maintenance of psychopathy. A task that has been proven to be capable of simulating punishment-reward contingencies is the IOWA gambling task. Decisions to choose from decks of cards become motivated by punishment and reward schedules inherent in the task. Importantly, clinical and subclinical psychopaths demonstrate a risky, disadvantageous pattern of decision-making in the task, indicating motivational imbalance (insensitivity for punishment and enhanced reward dependency). Here, in a double-blind placebo-controlled crossover design (n=12), whether a single administration of testosterone would shift the motivational balance between the sensitivity for punishment and reward towards this tendency to choose disadvantageously was investigated. As hypothesized, subjects showed a more disadvantageous pattern of decision-making after testosterone compared to placebo administration. These findings not only provide the first direct evidence for the effects of testosterone on punishment-reward contingencies in humans, but they also give further insights into the hypothetical link between testosterone and psychopathy. (Jackvan H. *et al.*, 2004)

**Fourth: Elevated rates of testosterone-related disorders in women with autism spectrum conditions**

The androgen theory of autism proposes that autism spectrum conditions (ASC) are in part due to elevated fetal testosterone (FT) levels,

which are positively correlated with a number of autistic traits and inversely correlated with social development and empathy. A medical questionnaire was completed by n= 54 women with ASC, n= 74 mothers of children with ASC, and n= 183 mothers of typically developing children to test whether women with ASC have an increased rate of testosterone-related medical conditions, and to see whether mothers of children with ASC show similar abnormalities, as part of the 'broader autism phenotype'. Compared to controls, significantly more women with ASC reported (a) hirsutism, (b) bisexuality or asexuality, (c) irregular menstrual cycle, (d) dysmenorrhea, (e) polycystic ovary syndrome, (f) severe acne, (g) epilepsy, (h) tomboyish, and (i) family history of ovarian, uterine, and prostate cancers, tumors, or growths. Compared to controls, significantly more mothers of ASC children reported (a) severe acne, (b) breast and uterine cancers, tumors, or growths, and (c) family history of ovarian and uterine cancers, tumors, or growths. These results suggest current hormone abnormalities in women with ASC and their mothers. Direct investigations of serum testosterone levels and genetic susceptibility to high testosterone production or sensitivity in women with ASC would illuminate the origin of these conditions. The relationship between FT and current testosterone levels also needs to be clarified. The present results may be relevant to understanding the increased male risk to developing autism. (Erin L. *et al.*, 2007 )

# **Chapter Three**

## **Methodology**

## Methodology

This chapter presents methods which a research study was achieved via: design of study, administrative arrangement, setting of the study, sample of the study, inclusion criteria, exclusion criteria, study instrument, validity of the instrument pilot study, methods of data . collection and statistical analysis

**design of the Study** : Descriptive cross-sectional design study of **.3.1** nursing students' knowledge about Effectiveness of Educational program on Female students Knowledge regarding increase Testosterone level in women, started from 14 November 2021 until 13 April 2022 in order to .complete study

**3. Administrative and ethical approval Arrangement** : There **.2** was need for official request from the college of nursing for approval of the study to seek permission for data collection. The committee of research project at the college of nursing in university of Basra approved to collect data from nursing students due to Corona virus pandemic in .addition, individual permission and from each respondent in the study

**3.3 Setting of the Study** : The study was conducted at the college . of nursing in University of Basrah

**Inclusion criteria:** The sample was collected according to **.3.4.1** :following criteria

1. .Adult students 20 years and above
2. The student attends college of nursing and Medical Sciences and faculties of humanity university of Basrah
3. Students who accepted to participate in the current study Students were selected second and third and fourth stages only, both morning and evening
4. .Study type
5. Female students only
- 6.

### **3.4 :Exclusion Criteria.2**

1. .The student who refused to participate in the study
2. .Male students
3. Students of the first stage is not allowed to participate due to the inability to deliver the questionnaire form to participate in the study

**3.5 Instrument of the study:** The questionnaire consists of two parts, the first part consists of socio demographic characteristics (age, stage of the student, type of study,). The second part consists of 20 questions about Knowledge of students increasing testosterone

**3.6 Validity of the Instrument :** Content validity of the . instrument was established through a panel of (4) experts (Appendix A) .They were five members from College of Nursing/University of Basra. The purpose of reviewing the questionnaire by reviewers was to see of questionnaire in terms .clarity, relevance, and understandability

**3.7 Pilot Study:** A pilot study is conducted on a convenient sample of (69) college of nursing /university of Basra. They were excluded from original sample of the study to achieve the following

:

1. .To estimate the average time to fill the entire component
2. To finding whether the questionnaire was clear and understood by . the nurse

#### **The Result of the Pilot study showed that**

1. The average time that required to fill all the questionnaire (10-12) minutes
2. The item of the questionnaire was clear and understood
3. Reliability of the Questionnaire was obtained through measuring internal consistency of questionnaire items which are (20 . items)about

**3. Data collection method :** The educational program data was .8 : collected through

Presenting of questionnaire to the polytheists before giving a -1 . educational lecture and collecting it from them

2- .Giving the educational lecture for three days

3- Redistributing the questionnaire after the lecture and collecting it

**statistical analysis :** Data were analysis using SPSS version 17( **.3.9** frequency and percentage) . Dependent test was used to assess the effective of the educational program



# **Chapter four**

## **Results**

## Results

### Socio\_demraghic.4.1

**Table 1: soci\_demographic characteristics of the participant (n=69)**

Characters		Frequency	Percent
Age	19.00	6	8.7
	20.00	11	15.9
	21.00	22	31.9
	22.00	14	20.3
	23.00	10	14.5
	24.00	3	4.3
	26.00	1	1.4
	28.00	1	1.4
	29.00	1	1.4
College	Nursing college	48	69.6
	Medical specialties colleges	7	10.1
	Humanities colleges	14	20.3
Study stage	Second stage	24	34.8
	Third stage	6	8.7
	Fourth stage	39	56.5

Soci\_demographic characteristics table showed that most of participants were at the age of (21) years old (31.9) , from Nursing college (69.6%) , and at the second and fourth stage (34.8% and . (%56.5

**Table 2: Participants knowledge before and after educational program**

Knowledge		Frequency	percent
Before educational program	Poor knowledge	42	60.9
	Good knowledge	27	39.1
	Total	69	100.0
After educational program	Poor knowledge	1	1.4
	Good knowledge	68	98.6
	Total	69	100.0

As shown in table (2) there very good efforts of the educational program providing the participants good knowledge represented by the percent (98.6%) comparing the percent of (39.1%) before . application of educational program

**Table 3: the results of dependent two samples t\_test**

Before and after educational program	Paired Differences			T_test	df	Sin.(2tailed)
	Mean	.Std Deviation	Std. Error Mean			
Mean of score Mean of /1 score 2	0.35580	0.18581	0.02237	15.906	68	0.000

According to table (3) which represents t-test results, there is a highly significant differences in participants knowledge after application of the education program at probability of (0.05) which mean that the educational program has achieved its goal of providing participants with good knowledge regarding the . increasing of testosterone level in female

# **Chapter five**

## **Discussion**

## Discussion

Testosterone is a powerful hormone in both men and women. It has the ability to control sex drive, regulate sperm production, promote muscle mass, and increase energy. It can even influence human behavior, such as aggression and competitiveness. Our study about Effectiveness of Educational program on Female students Knowledge regarding increasing Testosterone level in women . Findings of this study showed that most of participants were at the age of (21) years old (31.9%) , from nursing college (69.6%) and at the second and fourth stage (34.8% and 56.5%) . The study showed also there was very good efforts of the educational program providing the participants good knowledge represented by the percent of (98.6%) , comparing with percent of (39.1%) before application of educational program. Findings of this study showed increase in the posttest mean compared with pretest ( $0.02237 \pm (0.18581 \pm 0.35580)$   $0.18581$  with  $t= 15.906$  at sig.(2-tailed =0.00) . Results were consistent with experimental study conducted by (shipra S, et al., on effectiveness educational program on knowledge of (2016 middle aged women regarding prevention of osteoporosis . The pretest ( $10.44 \pm 2.26$ ) increase to ( $19.66 \pm 2.28$ ) in posttest .There was increase in the known edge level ( $t= 33.19$  at p- value  $< 0.001$  ) Consistent also with an experimental study conducted by (Zhang . YP. Et al.2012 ) on the Evaluation of educational program for osteoporosis awareness and prevention among nursing students in China. Pretest Mean was ( $9.78 \pm 3.13$ ), which was increased to( In the posttest. There was a significant increase in the( $2.48 \pm 14.04$  knowledge level ( $t = 13.42$ ,  $p < 0.001$ ). . Also consistent with experimental study conducted by ( Hadayat A. et al.,2014) , on Implementation and Evaluation of Effectiveness of Educating Program for Upgrading Nurses' Knowledge Regarding Polycystic Ovaries Syndrome , Findings of the present study showed highly statistically significant improvement in nurses' knowledge Immediately after program implementation, as significant differences were found between the mean pre test and Post test

knowledge score. The post test mean percentage ( $60.77 \pm 10.85$ ) was found to be higher than the pretest mean percentage ( $13.37 \pm$  scores regarding PCOS). This finding is consistent with that (12.14 of a study Conducted by (Rodzik, 2008), in which the total osteoporosis self-efficacy scale score increased from pretest to posttest and the change was statistically significant. As well, the significant improvement of the maternity Nurses' knowledge after attending the program in the present study is congruent with (Abd El-Halem, 2012), Who mentioned that the educational program was effective in improving nurses' knowledge and performance Related to pregnancy induced hypertension. Result showed that there is a highly significant differences in participants knowledge after application of the education program at probability of (0.05) which mean that the educational program has achieved its goal of providing participants with good knowledge regarding the . increasing of testosterone level in female

# **Chapter Six**

## **Conclusion and Recommendation**

## **Conclusion**

Based on the result obtained from the data analysis , which concluded that there is poor knowledge of students before the application of educational program . while there is very good knowledge after application educational program .According to this result ,the educational . program achieved the goal

## **Recommendation**

Dissemination of awareness advertisements to clarify the .dangers of high testosterone in Women  
Introducing the topic of hormonal disorders in women including .testosterone into the school curricula  
Conducting an extensive study by taking larger community .samples  
.Maintaining weight, healthy eating and doing physical exercises



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# **Appendix**

**Appendix (A) Appendix (b) Appendix (C )**

## Appendix (A)

Experts who gave their opinions and instruction about the question  
. used to collect the study

ت	الاسم	اللقب العلمي	الشهادة و الاختصاص	سنوات الخبرة	مكان العمل
1	أ.د. سميرة محمد ابراهيم	أستاذ	دكتوراه طب الأسرة والمجتمع	30 سنة	كلية التمريض
2	أ.م.د. وصفي ظاهر عبد علي	استاذ مدرس	دكتوراه فسلجة	30 سنة	كلية التمريض
3	أ.د. هشام حسين عبد الرؤوف	مدرس	دكتوراه أشعة تشخيصية	22 سنة	كلية التمريض
4	م.د. واثق فرعون	مدرس	دكتوراه فسلجة	11 سنة	كلية التمريض

## Appendix (B)

### Effectiveness of Educational program on Female students Knowledge regarding increasing Testosterone level in women

**First axis :** social demographics information

.....: **Age** :.....

**College** :.....

**Stage**

**Second axis :** A questionnaire about the effect of an educational program on the knowledge of female students to increase the hormone testosterone in women

High testosterone in female causes physical symptoms , including-1

- Excess body hair especially facial hair
- The roughness of the sound
- Youth pills
- All mentioned true

High level of testosterone cause all this , except -2

- An unregulated menstrual cycles
- Decrease weight
- Mood change and severe depression
- Don't know

One of the causes of high testosterone in women-3

- Ovariectomy
- Adrenal insufficiency
- Polycystic ovaries
- Don't know

High testosterone in women is -4

- Genetically in all non-genetic situations, but
- obtains because of some diseases may be genetically or
- non-genetic
-

Don't know

Among the drugs used to treat high testosterone-5

- Progestin
- Metformin
- All of the above
- Don't know

Testosterone hormone arrives at its top levels in the woman's body at the-6 age

- Twenties
- Thirties
- Forties
- Menopause

Of the benefits of testosterone in women-7

- Responsible for organizing the menstrual cycle
- Maintaining the health of the body
- Stimulates the growth of the ovarian
- Don't know

Testosterone hormone produces members in the female body-8

- Ovaries
- Adrenal gland
- All of above
- Don't know

Testosterone hormone increase in-9

- Morning
- The evening
- The night
- Don't know

Testosterone hormone in women is diagnosis through-10

- Blood test
- Blood and urine test
- Examination and Blood test
- Don't know

<b>N</b>		<b>True</b>	<b>False</b>
<b>.11</b>	<b>The high level of testosterone can cause a decrease in sexual desire</b>		
<b>.12</b>	<b>The women produce large quantities of testosterone known as the name of Androgen</b>		
<b>.13</b>	<b>High testosterone hormone leads to hair loss</b>		
<b>.14</b>	<b>High testosterone hormone may prevent pregnancy</b>		
<b>.15</b>	<b>Testosterone is a female hormone</b>		
<b>.16</b>	<b>Testosterone plays a major role in maintaining female reproductive tissues</b>		
<b>.17</b>	<b>Low level of insulin can cause height in testosterone hormone</b>		
<b>.18</b>	<b>Diagnosis of high testosterone in women with several roads including(sonar )</b>		
<b>.19</b>	<b>Pregnancy pills help in increase testosterone</b>		
<b>.20</b>	<b>One of the symptoms of increase testosterone in women is an increase in body muscle mass</b>		

## Appendix (C )

تأثر برنامج تعليمي على معرفة الطالبات حول زيادة هرمون التستوستيرون لدى النساء

المحور الأول : المعلومات الديموغرافية الاجتماعية

العمر : ..... الكلية :..... المرحلة.....:

المحور الثاني : المعلومات العلمية حول ارتفاع هرمون التستوستيرون لدى النساء

1\_ ارتفاع هرمون التستوستيرون لدى الإناث

يسبب اعراضا جسدية بما فيها

شعر الجسم الزائد وخاصة شعر الوجه  خشونة

الصوت  حب الشباب  جميع ما ذكر

2\_ المستويات المرتفعة من هرمون

يأتي ما عدى

دورات الحيض غير المنتظمة

تغيير المزاج وأكتئاب حاد

نقصان الوزن

التستوستيرون تسبب كلا مما

لا

اعلم

3\_ ارتفاع هرمون التستوستيرون

لدى النساء يكون

وراثيا في كل الحالات

قد يكون وراثيا أو غير وراثي

غير وراثي إنما يحصل بسبب بعض الأمراض

لا اعلم

4\_ من أسباب ارتفاع هرمون

استئصال المبيض

تكريس المبيض

التستوستيرون لدى النساء هو

قصور في الغدة الكظرية

لا اعلم

5\_ من الأدوية المستخدمة لعلاج هرمون التستوستيرون

البروجستين  المورفين  جميع ما

ذكر  لا اعلم  6\_ يصل هرمون التستوستيرون في قمة

مستوياته في جسم المرأة في عمر

العشرينات  الثلاثينات

الأربعينات  سن اليأس

7\_ من فوائد هرمون التستوستيرون لدى النساء

مسؤول عن تنظيم الدورة الشهرية  يحافظ على صحة الجسم

تحفيز نمو المبيض  لا اعلم

8\_ ينتج هرمون التستوستيرون في عدة اعضاء في جسم الانثى

المبايض  الغدة الكظرية  جميع ما ذكر  لا اعلم

9\_ يرتفع هرمون التستوستيرون في

الصباح  المساء  الليل  لا اعلم

10\_ يتم تشخيص هرمون التستوستيرون لدى النساء من خلال

فحص الدم  فحص البول والدم

الفحص البدني وفحص الدم  لا اعلم

ت	خطأ	صح
11		ارتفاع هرمون التستوستيرون يمكن ان يسبب انخفاض في الرغبة الجنسية
12		تنتج النساء كميات كبيرة من هرمون التستوستيرون المعروف بأسم الأندروجين
13		ارتفاع هرمون التستوستيرون يؤدي الى تساقط الشعر
14		ارتفاع هرمون التستوستيرون قد يمنع الحمل
15		التستوستيرون هو هرمون أنثوي
16		يلعب هرمون التستوستيرون دورا كبيرا في الحفاظ على الانسجة التناسلية لدى الانثى
17		انخفاض مستويات الانسولين يمكن ان تسبب ارتفاع في هرمون التستوستيرون
18		يتم تشخيص ارتفاع هرمون التستوستيرون لدى النساء بعدة طرق منها (السونار) الفحص بالموجات فوق الصوتية )
19		تساعد أقراص الحمل على زيادة هرمون التستوستيرون
20		من أعراض زيادة هرمون التستوستيرون لدى النساء زيادة كتلة عضلات الجسم



## الخلاصة

### خلفية :

تُعرف هرمونات التستوستيرون الجنسية في الغالب بدورها في تطور الأعضاء الجنسية والنضج البدني خلال فترة البلوغ. التستوستيرون هو الأهم المنتشر والذي يحدث بشكل طبيعي الأندروجين في كل من الرجال والنساء. في النساء ، يتم إنتاج هرمون التستوستيرون بشكل أساسي من خلال التحويل المحيطي للأندروستيرون) 50 بالمائة) مع تركيز باقي الإنتاج في المبيض) 25 بالمائة) وقشرة الغدة الكظرية) 25 بالمائة) .

### الهدف من الدراسة:

تقييم فعالية البرنامج التعليمي على المعرفة الطلابية للطلاب عن زيادة مستوى هرمون تستوستيرون .

### المنهجية والمواد:

دراسة تصميمية وصفية مقطعية للتمريض والعلوم الطبية وكليات الإنسانية معرفة الطلاب حول فعالية البرنامج التعليمي للطالبات المعرفة المتعلقة بزيادة مستوى التستوستيرون لدى النساء ، بدأت من 14 نوفمبر 2021 حتى 13 أبريل 2022 من أجل دراسة كاملة.

جمعت الدراسة في كلية التمريض / جامعة البصرة. تم جمع العينات (69) وفقاً لـ) البالغ 20 عاماً فأكثر ، الطلاب الذين شاركوا من الصف ، الثاني ، الثالث ، الرابع ، فقط.

يتكون السؤال من جزأين ، الجزء الأول يتكون من الخصائص الاجتماعية الديموغرافية. الجزء الثاني يتكون من 20 سؤالاً حول معرفة الطلاب بزيادة هرمون التستوستيرون .

### نتيجة الدراسة:

إظهار نتيجة الدراسة جهود جيدة للغاية من البرنامج التعليمي مما يوفر المعرفة الجيدة للمشاركين الممثلة بنسبة النسبة المئوية) 98.6% (مقارنة النسبة المئوية من) 39.1% (قبل تطبيق البرنامج التعليمي .

### الاستنتاج :

بناء على النتيجة التي تم الحصول عليها من تحليل البيانات، والتي خلصت إلى وجود معرفة سيئة للطلاب قبل تطبيق البرنامج التعليمي . في حين أن هناك معرفة الطالبات جيدة جدا بعد تطبيق البرنامج التعليمي . وفقاً لهذا النتيجة، حقق البرنامج التعليمي الهدف

## التوصيات :

نشر إعلانات التوعية لتوضيح مخاطر هرمون تستوستيرون عالية لدى النساء  
تقديم موضوع الاضطرابات الهرمونية في النساء بما في ذلك هرمون تستوستيرون في  
المناهج الدراسية .  
إجراء دراسة واسعة من خلال أخذ عينات مجتمع أكبر.  
الحفاظ على الوزن والأكل الصحي والقيام بالتمارين البدنية.



تأثير برنامج تعليمي على معارف الطالبات حول زيادة هرمون التستوستيرون لدى النساء

قطر الندى جواد يونس

زهراء عدي يوسف

بإشراف

أ.د. زينب علك حسن

2022\_2021 البصرة