ARTICLE 1

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Universal Journal of Sport Sciences

Journal profile

Universal Journal of Sport Sciences (UJSS) is a peer-reviewed open access journal, provides an international forum for the presentation of research findings and scholarly exchange in the area of Sports and Recreation. The journal has a special focus on sport science, recreation/leisure studies, exercise science and dance studies, human sciences broadly defined, applied to sport and exercise. Although preference is given to manuscripts presenting the findings of original research, review and methodological pieces will also be considered.

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Effect of 8 Weeks of Physical Activity to Improve the Physical and Psychological State of 13 Women Under 30 Undergoing Treatment for Breast Cancer at the Saint Nicolas Clinic in Porto-Novo

YESSOUFOU Lafiou, **DOSSOU Sèmako Gérard**, **TIGRI Tertutie Nawal**, **LAWANI Mohamed Mansourou**, **HOUETO Vignon Gratien**, **AGBAYAHOUN Neddy Ornella Mahugnon**

Universal Journal of Sport Sciences **2022**, 2(1), 39-54. DOI: 10.31586/ujss.2022.494

Abstract Breast cancer is the most commonly diagnosed form of cancer in women. Several studies have shown the benefits of physical activity (PA) before and after treatment on the physical and psychological components of patients. Almost all of the studies mentioned are carried out on non-African patients over the age of [...] Read more.

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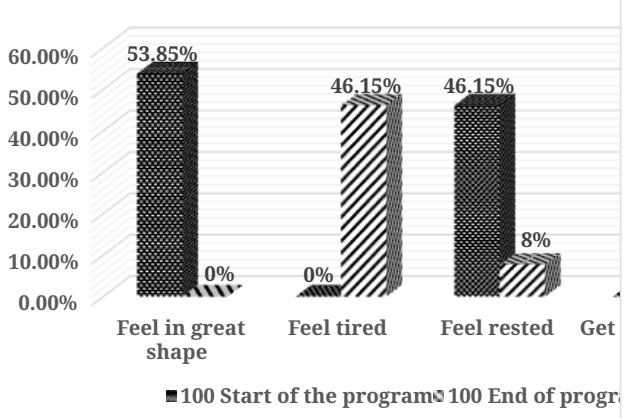

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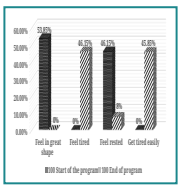

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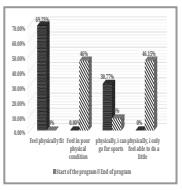

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Test and Measurement: US Army Combat Field Testing Protocol and Exploratory Analysis

Alexander S. Buske, **Colin G. Pennington**

Universal Journal of Sport Sciences **2022**, 2(1), 34-38. DOI: 10.31586/ujss.2022.431

Abstract The importance of resistance training (Conley & Pennington, 2022; Pennington, 2020) cardiovascular fitness (Pennington, 2015; 2016), and anaerobic power (Pennington, 2014) cannot be overstated for individuals enlisted in our country's

armed forces. The Army Combat Fitness Test (ACFT) is the new branch wide fitness test designed to replace the outdated [...] Read more.

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Student-Athlete Burnout: A Division I Women's Soccer Coach's Perspective

Colin G. Pennington, **Delaney Castor**

Universal Journal of Sport Sciences **2022**, 2(1), 25-33. DOI: 10.31586/ujss.2022.383

Abstract With numerous unique physical, mental, psychological, and emotional challenges associated with being a university-level student-athlete, it can be assumed that student-athletes may be at great risk of mental health conditions such as burnout. Burnout results from the interaction of three different elements: physical or emotional exhaustion, sport devaluation, and reduced [...] Read more.

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Emmanuel Osei Sarpong, **Michael Sedegah Mawuli**, **Ebenezer Ofosu Kofi**

Universal Journal of Sport Sciences **2022**, 2(1), 16-24. DOI: 10.31586/ujss.2022.276

Abstract Sports injuries among student-athletes in high schools have become prevalent in most developing countries such as Ghana. In identifying the prevailing injuries among senior high student-athletes in the Akuapem municipality, a descriptive cross-sectional survey design was used. A total of 610 student-athletes were purposely selected for the study to respond [...] Read more.

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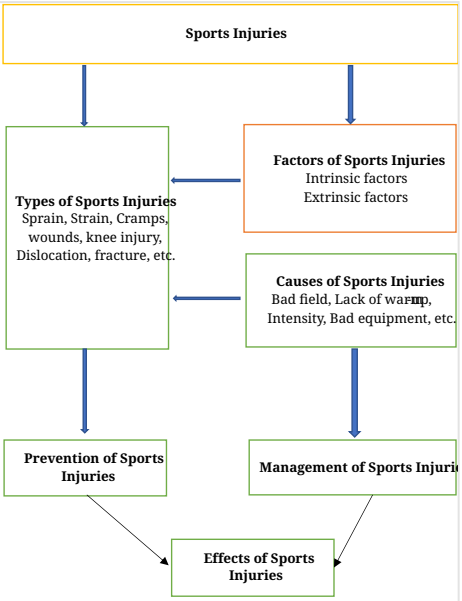

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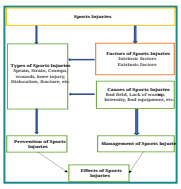

Figure 1

Variables Associated with Low Female Participation in College of Education

Participation in College of Education Sports in Central, Western and Western North Regions of Ghana

Emmanuel Osei Sarpong, **Charlotte Adomah Diabor**, **Benjamin Martin Appiah**, **Michael Aniabre**, **Ernest Tsikata**

Universal Journal of Sport Sciences **2022**, 2(1), 1-15. DOI: 10.31586/ujss.2022.274

Abstract The purpose of the study was to examine factors associated with low female participation in colleges of education sports. The population of the study was made up of female colleges of education athletes from Central, Western and Western North Regions of Ghana. Purposive and simple random techniques were used to [...] Read more.

Strength Training Guide for Personal Training Practitioners

Jared Conley, **Colin G. Pennington**

Universal Journal of Sport Sciences **2022**, 1(1), 33-42. DOI: 10.31586/ujss.2022.252

Abstract Resistance exercise is the performance of physical exercises designed to improve strength, muscular, endurance, hypertrophy, and neuromuscular efficiency with the use of weights (Braith & Stewart, 2006)[1]. Resistance exercise has long been utilized for its beneficial health qualities and propensity to elicit certain desired physiological changes (Fry, 2004)[2]. There has [...] Read more.

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How to Increase Customer Satisfaction by Beautifying Sports Facilities? What is the Key Role of Service Quality?

Mohammadbagher Forghani Ozrudi

Universal Journal of Sport Sciences **2022**, 1(1), 28-32. DOI: 10.31586/ujss.2022.226

Abstract The purpose of this study was to investigate the key role of service quality and beauty of sports facilities in increasing customer satisfaction. The research method is descriptive and correlational research. The statistical population of the study was 154188 organized athletes covered by sports insurance (103890 men, 50298 women) who [...] Read more.

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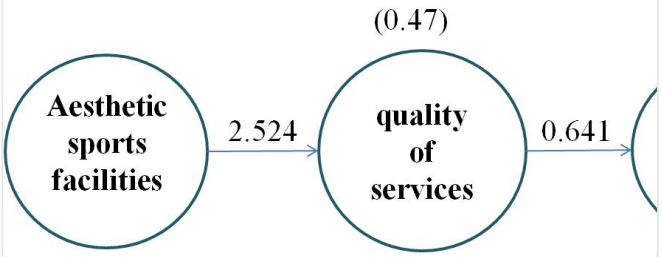

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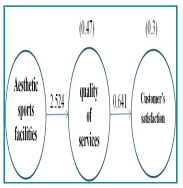

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Assessing the Locomotor and Object Control Skill Levels of Basic Pupils in Ghana: The Role of Physical Education

Ernest Tsikata, **Charlotte Adomah Diaboh**, **Annette Eugenia Ama Aboagye**

Universal Journal of Sport Sciences **2021**, 1(1), 19-27. DOI: 10.31586/ujss.2021.115

Abstract **Objective:** The study employed a quasi-experimental design of a single group pre-test post-test. The purpose of the study was to assess the locomotor and object control skill development levels of 6-8-year-old basic school pupils in Kwahu Afram Plains South district of Ghana The target population for the study comprised [...] Read more.

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Effect of Vibration to Fatigued Plantar Flexor Muscles on Postural Stability in Healthy Young Adults

Parth Doshi, **Isha Akulwar-Tajane**

Universal Journal of Sport Sciences **2021**, 1(1), 11-18. DOI: 10.31586/ujss.2021.010102

Citations 0

Abstract **Objective:** The effects of muscle fatigue appear to elicit a transient means of postural instability; however, the recovery of postural stability after fatiguing exercise has not been extensively studied. This study aimed to determine the immediate effect of local vibration applied to fatigued plantar flexor muscles on postural stability in [...] Read more.

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Prolonged Sitting Posture: Massage and Physical Exercise Program as Effective Therapy in 45 Sedentary Officers using Their Vehicles Full Time

Dossou Semako Gerard, **Lawani Mohamed Mansourou**, **Yessoufou Lafiou**, **Tigri Tertulie Nawal**, **Houeto Vignon Gratien**, **Lawani Mohamed Nadil Olabiss**

Universal Journal of Sport Sciences **2021**, 1(1), 1-10. DOI: 10.31586/ujss.2021.010101

Views 1355 | Downloads 170

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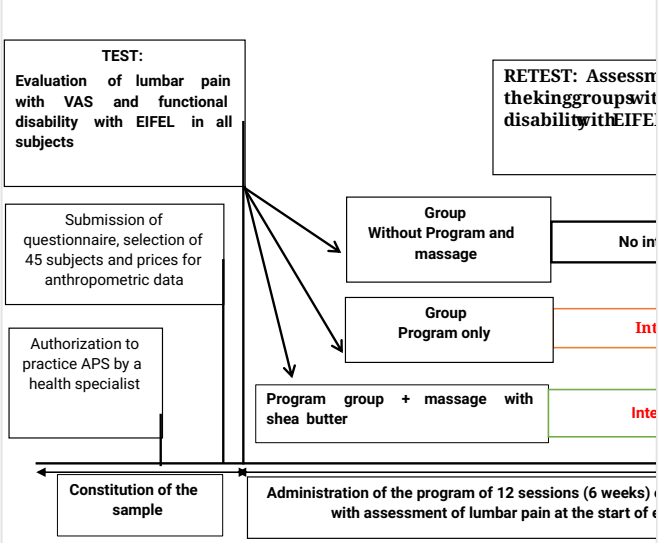
Abstract The high prevalence of low back pain associated with prolonged sitting as a result of work demands, is a major public health problem. Added to this is the sedentary lifestyle and full-time use of vehicles, keeping workers in this seated position. We now know the many benefits of regular exercise [...] Read more.

Figures



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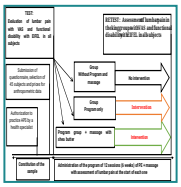

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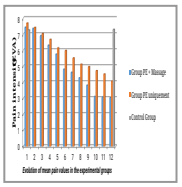

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Universal Journal of Sport Sciences, 2022, 2, 494
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DOI: 10.31586/ujss.2022.494

Research Article

Effect of 8 Weeks of Physical Activity to Improve the Physical and Psychological State of 13 Women Under 30 Undergoing Treatment for Breast Cancer at the Saint Nicolas Clinic in Porto-Novo

YESSOUFOU Lafiou [1,2], DOSSOU Sèmako Gérard [1,2,*], TIGRI Tertutie Nawal [1,2], LAWANI Mohamed Mansourou [2,3], HOUETO Vignon Gratien [1,2], AGBAYAHOUN Neddy Ornella Mahugnon [2]

[1] Doctor at the National Institute of Physical Education and Sport (INJEPS), BP 169 Porto-Novo, Benin

[2] Laboratory of Biomechanics and Performance (LaBioP) INJEPS / Porto-Novo University of Abomey-Calavi, Benin

[3] Full Professor in Biomechanics of Gesture at INEPS, University of Abomey-Calavi, Benin

[*] Correspondence: DOSSOU Sèmako Gérard (dossousemako@gmail.com)

Abstract: Breast cancer is the most commonly diagnosed form of cancer in women. Several studies have shown the benefits of physical activity (PA) before and after treatment on the physical and psychological components of patients. Almost all of the studies mentioned are carried out on non-African patients over the age of 40. And no experimental studies have been carried out in young patients undergoing treatment for breast cancer. This is how we asked ourselves the question of whether a physical exercise program carried out on young Beninese women under the age of 30 undergoing treatment for breast cancer at the Saint Nicolas clinic in Porto-Novo could it have the same effects on their physical and psychological components? Our objective through this research is to study the potential effect of a physical activity program on the physical and psychological state in women under 30 years old (27±5.8 years) undergoing treatment for a breast cancer at the Saint Nicolas clinic in Porto-Novo. An experimental study was then carried out with 13 patients (very low rate of women in this section suffering from breast cancer) undergoing treatment throughout 2022 at the Saint Nicolas clinic in Porto-Novo. The experimental group followed a physical activity program consisting of aerobic and muscular exercises; over a period of 8 weeks. According to the data collected and the feedback from the patients, the physical activity program seems to have been beneficial for most of them. There is an improvement in the quality of life and the physical condition of the patients. In addition, the management of physical fatigue and psychological fatigue also seem to improve. There was also a marked improvement in the ability to concentrate and self-esteem. The physical activity program has improved the physical and psychological state of Beninese women with breast cancer

Keywords: Breast cancer, Physical activity, Quality of life, Physical condition, Fatigue

How to cite this paper:
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1. Introduction

Chronic diseases (cardiopathy, stroke, cancer, chronic respiratory diseases, diabetes, etc.) are the leading cause of death in the world (63% of deaths) [1]. They affect all age groups and, after 60, a majority of women. Cancers figure prominently among chronic diseases. Their number increases every year due to the aging of the population (the incidence of cancer increases with age), but also due to the improvement of screening

devices [2]. Breast cancer is a malignant tumor that develops in the mammary gland [2]. According to the International Agency for Research on Cancer (IARC), female breast cancer has become the most commonly diagnosed type of cancer in the world [3].

Breast cancer is a disease that develops from the cells that make up the mammary gland. An initially normal cell transforms and multiplies in an anarchic and excessive way, to form a mass, called a malignant tumor [3]. A cancerous (malignant) tumor is a group of cancerous cells that can invade nearby tissues and destroy them. It can also spread (metastasize) to other parts of the body. Breast cells sometimes undergo changes that cause them to grow or behave abnormally. These changes can lead to non-cancerous (benign) breast conditions, such as atypical hyperplasia and cysts. They can also lead to the formation of non-cancerous tumours, including intraductal papillomas [4]. There are different types of breast cancer depending on the type of cells from which they form [5]. The most frequently encountered breast cancers are adenocarcinomas. They develop from the epithelial cells of the mammary gland. The cancer can start in the cells lining the ducts, which are tubes that carry milk from the glands to the nipple [4]. This type of breast cancer is called ductal carcinoma. Cancer can also form in the cells of the lobules, which are groups of milk-producing glands. This type of cancer is called lobular carcinoma. Both ductal carcinoma and lobular carcinoma can be in situ, meaning the cancer remains in its original location and has not invaded nearby tissues. They can also be infiltrative, or invasive, i.e. they have invaded neighboring tissues [6].

There are several risk factors that contribute to the onset of breast cancer and its development. The main ones are: age (Breast cancer most often develops around the age of 60, in 50% of cases, breast cancer affects women aged between 50 and 69. Less than 10% of breast cancers occur before the age of 35 [7]. One in eleven women will develop breast cancer during her lifetime [3]. The risk of having breast cancer increases with age); family history (the risk of breast cancer increases if a first-degree relative (mother, sister, daughter) has had breast cancer before and especially before menopause); genetic predispositions (genetic alterations caused by tobacco, obesity, alcohol, physical inactivity, physical inactivity, chronic inflammation and chemical agents such as nickel, arsenic or radon [8-10]) and personal history (Having already had breast cancer multiplies by 3 or 4 the risk of developing another breast cancer [11], history of irradiation of the chest, overweight, smoking, regular consumption alcohol or fatty meats, late pregnancy, hormone replacement therapy for menopause, type 2 diabetes or taking hormonal contraception [12, 13]).

In 2020, there were 2.3 million women with breast cancer and 685,000 breast cancer deaths worldwide [14]. End of 2020; 7.8 million living women had been diagnosed with breast cancer in the past five years, making breast cancer the most common cancer worldwide [14].

Breast cancer is therefore present in all countries of the world and affects women of all ages from puberty. Globally, women lose more years of life to breast cancer than to any other type of cancer [15]. The WHO notes that in sub-Saharan Africa, breast cancer is the leading cause of cancer death among women. In Benin, the Ministry of Health set up a cancer registry in 2014, according to which breast cancer is the most common in women. One in 9 women will be struck by breast cancer in her lifetime, and one in 20 will die from it. Early treatment improves the chances of survival for women affected by breast cancer. In our country, the ignorance of the symptoms of the disease, which means that cancer is mainly discovered at an advanced stage; the use of traditional healers which delays the medical treatment of women; the non-existence of social security, leaving women and their families with the heavy burden of medical care costs; their insufficient financial means which constitute another obstacle to the care of women; the weak technical platform and the small number of oncologists in Benin are all factors that reduce the chances of survival for sick women. It is important for us through scientific research to

find less expensive means for the effective management of side effects of health care in Beninese patients.

In general, there are several types of cancer treatment: surgery, chemotherapy, radiotherapy and hormone therapy. These different types of treatment affect the patient physically, socially and psychologically. One of the new challenges is therefore to reduce the side effects caused by the disease and also by the treatments. To combat these undesirable effects, one of the means that we have identified and especially recommended by the WHO and specialists in the field, is physical activity.

Several studies have shown the beneficial effects of regular physical activity practiced before and after treatment in women with breast cancer. Numerous studies also suggest that PA after the diagnosis of breast cancer is useful in reducing symptoms (fatigue, overall alterations in physical abilities, reduced self-esteem, etc.) and in improving quality of life [16-18]. Physical activity reduces chronic inflammation by acting on pro-inflammatory cytokines. [19-22]. Aerobic physical activity helped reduce oxidative stress in postmenopausal survivors by increasing their antioxidant capacity [23]. Oxidative stress is an important factor in the progression and recurrence of cancer. This is how physical activity will play a preventive role in breast cancer [24, 25].

They allow effective psychological, physical and social care of patients during and after treatment [26]. Studies show the positive effects on physical factors (cardiorespiratory capacity, general physical conditions: strength, flexibility, muscular endurance, balance, etc.) [26], the practice of physical activity during and after treatment [27-29]. Indeed, physical activities improve the state of depression, anxiety, image and self-esteem [30, 31]. Also, physical activities improve social functioning and relationships with others [32, 33], as well as better family well-being [34]. In addition, physical activities promote improved life satisfaction [34, 35] and the level of self-efficacy of patients, that is to say the judgment of their ability to succeed in initiating and maintaining a change, has also been improved [36]. These benefits are more evident when the activity is practiced in a group. Group cohesion (links between members, cooperation, etc.) would have a positive impact on quality of life [28].

Almost all of the work mentioned was carried out outside the African continent. In addition, this work was carried out on subjects aged over 40 up to 70 years. In addition, very few studies have looked at the beneficial effects of a physical activity program in a sample of young women and none in the literature have done so during chemotherapy treatments.

Could we obtain the same results with younger patients who live in Africa in poor living conditions, with a low economic level, in malnutrition and especially with the psychological pressure of society at the limit assimilated to a rejection, generated by lack of social support?

In West Africa and particularly in Benin, among so many studies carried out, to our knowledge. No studies have been conducted on the effect of an exercise program on the management of effects in women undergoing treatment for breast cancer. Also, it should be added that the clinical studies carried out in Benin by Gnangnon et al. [37] show that the patients were young, as in the majority of African series. In addition, Beninese patients often have difficulty representing themselves doing sports, and are mostly sedentary, which is not to their advantage. It is therefore with the aim of participating in the change of attitude of patients and of making known the effects of the practice of physical activities in women with breast cancer that we asked ourselves the following question: What are the effects of a physical exercise program for Beninese women under 30 undergoing treatment for breast cancer in the city of Porto-Novo?

To answer this question, the present study aims to highlight the potential benefits of a physical activity program on the physical and psychological state of women under 30 undergoing treatment for breast cancer at the Saint Nicolas clinic in Porto-Novo. She

wants to explore the benefits that Beninese women can derive from it to achieve a break with the medical world and reconnect with the social and professional world.

Based on the work in the literature mentioned above, we hypothesized that a physical activity program can improve the physical and psychological state of young Beninese women under 30 undergoing treatment for breast cancer, breast in the Saint Nicolas Clinic in Porto-Novo.

To verify this hypothesis, we set ourselves the objective of evaluating the physical and psychological improvement that 8 weeks of physical exercise can generate in these young Beninese women using the following method.

2. Method

This is an experimental study carried out on 13 women suffering from breast cancer; being treated at the time of inclusion, at the Clinique Saint Nicolas de Porto-Novo in Benin. This study was undertaken from November 2021 until August 2022. It was undertaken within the Biomechanics and Performance Research Unit (URBioP) of the National Institute of Physical Education and Sports (INEPS). This study brought together 13 young Beninese women aged 24 to 29 (27±5.8 years) undergoing treatment for breast cancer at the Saint Nicolas Clinic in Porto-Novo. This extremely small number of our sample is explained by the rarity of women in this bracket to contract breast cancer (very low rate of women with breast cancer at this age). In addition, nearly a third (1/3) of women in this age group approached during the study period refused to participate in physical activity sessions. And the reasons given were muscle weakness and especially the general fatigue she felt. It should be added that only voluntary patients who agreed to participate in the study and who received authorization from the attending physicians were taken into account for this experiment.

The interest of this program is to participate in the change of attitude of patients and to make known the effect of the practice of physical activities on women with breast cancer. In the department of Ouémé, no PA practice program existed when it was set up and the patients were unaware of the practice of PA during their treatment. They were therefore very reluctant to practice PA. Several activities were proposed, making it possible to diversify the sessions and work approaches. In this way, patients develop their cardiorespiratory capacity and their endurance, and their muscular strength. Despite incomplete participation, a maximum of patients benefited from a reduction in the risk of recurrence, overall and specific mortality by reaching at least 8 MET-h/week of AP.

To achieve our objective, we hypothesized that a physical exercise program improves the quality of life and the physical state of women undergoing treatment for breast cancer in the city of Porto-Novo. Specifically, we have:

- Evaluated the quality of life and physical condition of women undergoing treatment for breast cancer before and after the execution of a physical activity program.
- Compared the quality of life and physical condition of women undergoing breast cancer treatment before and after performing a physical activity program.

Only women meeting the selection criteria were selected for this study. They are:

- **Inclusion criteria**
    - Be volunteer;
    - Having breast cancer and undergoing treatment;
    - Have the agreement of your attending physician to practice physical exercises;
    - Be available and have signed written informed consent.

- **Non-inclusion criteria**
  - The study did not include sick women who were not undergoing any treatment for breast cancer;
  - The presence of other acute and/or severe and/or chronic illnesses;
  - Patients in stage 4 of the disease.
- **Exclusion criteria**
  - Patients who have not completed one of the two forms;
  - Patients who have been absent at least 3 times in succession during the program.

2.1. Materials and techniques

To carry out this study, we used a mixed methodology (qualitative and quantitative) [38]. Indeed, we used a questionnaire and a semi-structured interview. The quantitative methodology includes:

- A social support questionnaire adapted to cancer (QSSS-c) aimed at evaluating perceived social support in its emotional (protection and reassurance), material/entertainment (service provided in a material or financial way), informative (advice, information on questions of the person);
- And negative (awkwardness on the part of some people, lack of support) [39]. It is composed of 20 items for which the subjects must assess the frequency of supportive behaviors on a 5-point Likert-type scale, from 1 "never" to 5 "very often". The higher the scores obtained, the higher the perception of support;
- A quality of life scale (FACT-B) evaluating the overall quality of life of patients with breast cancer [40]. This scale includes four subscales: physical, family and social, emotional and functional well-being. It is composed of 37 items for which the patients evaluate their feelings on a 4-point Likert-type scale, from 0 "not at all" to 4 "extremely". The higher the score, the higher the quality of life. The latter is used for complementary purposes, in order to provide quantitative data and to assess the quality of family and social life of the participants.

The interviews were conducted using a grid allowing the following topics to be addressed in the patients of our sample: the evolution of fatigue, the physical state, their physical capacity, the evolution of psychological fatigue , the evolution of the ability to concentrate, the evolution of the physical state and the evolution of the quality of life of the woman.

2.2. Data collection protocol

Data collection was carried out in three phases. The first phase is devoted to raising the awareness of the subjects. We had an interview with a gynecologist-oncologist at the Saint Nicolas clinic, on the advantages of the study. He then gave us permission to work with his patients and we attended chemotherapy sessions which allowed us to come into contact with the women. The information sheets and consents were read and completed by the participants. An evaluation of the inclusion criteria made it possible to retain among the patients who gave a favorable agreement, those who met the criteria of this study. The second phase was devoted to filling out the first individual form and taking anthropometric data. This first collection of data concerned the socio-professional characteristics of the subjects (sex, age, profession, level of education, language), anthropometric data (body mass, height, body mass index), the practice of physical activity and athletic; the various frequent discomforts due to the treatment. Thereafter, we

met twice a week (Tuesday and Saturday) for 8 weeks for practical physical activity sessions consisting of stretching, walking and muscle strengthening exercises. After the eight weeks of regular physical exercise, the anthropometric data were taken again and the subjects completed the second form.

Physical activities were supervised by a physical activity educator and a doctor in charge of monitoring these women suffering from breast cancer. The supervision made it possible to practice physical activities in complete safety. The physical educator was able to adapt the exercises offered to each patient according to their physical and psychological limits. In the context of PA, the approach of the educator was not competition and performance, but the search for the well-being of patients with support for their emotions and their expectations. By including a referring doctor in the treatment, the program could be offered to patients with a functional phenotype with moderate limitations. He was available in case of injuries or questions from the educator and the patients. The group cohesion that has been created has made it possible to accentuate the moments of discussion around the disease, sharing and listening with other women. They describe PA sessions as a valve in their daily life, a moment to talk and escape. Bonds have been established between them.

2.3. Physical exercise program

Physical exercise program 8-week supervised exercise program twice a week.

- Practice the equivalent of 30 minutes of brisk walking
- Muscle strengthening:
    - **Loading modality:** 1 to 3 sets of 7 to 10 repetitions; rest time between each series 1 minute
    - **Dorsals**: Dumbbell in hammer grip, extension of the arm at the shoulder; variants (pronation or supination of the wrist)
    - **Quadriceps and glutes**: Squat with load kept glued to the chest (use a bench to minimize the risks); Sitting with straight legs, full extension of the leg at the knee; then controlled return to initial position with knee flexion
    - **Pectorals**: Extension of the forearm at the elbow load in hand (with flexion of the arm at the shoulder to minimize shearing)
    - **Position:** lying on the ground on a mat, to avoid shoulder extension during the return phase
    - **Hamstrings**: Raising the pelvis on the ground
    - **Abdominals:** Sitting with straight legs, leaning on his elbows; alternating movement of hip flexion and knee flexion
- Stretching session
    - Fingers crossed above the head, tried to touch an imaginary ceiling
    - Keep your back straight, perform a retroversion of the pelvis (decrease the back) by tightening the buttocks
    - Lying on your back, squeeze the buttocks, pull the knee to the chest
    - Lying down, pull the knee towards the opposite hip, press the other knee to the ground
    - Standing self-extension and breathing work: (Tighten the gluteal muscles and the abdominal wall; Retroprojection of the head (tuck the chin into the chest and stick the head to the wall); Lower the shoulders, thumbs out, inspiration: 4 seconds; we inhale through the nose and inflate the belly; we hold our breath for 4 seconds while keeping the position; then we exhale through the mouth)

2.4. Ethical considerations

All participants in this study were informed of the content of the data collection protocol, the aims and the benefits of the study. They were reassured that at the end of the research, the results obtained will be communicated to them as soon as possible and in a confidential manner. They have also obtained the prior guarantee that the data collected will be used anonymously and exclusively to achieve the objectives of this research.

2.5. Statistical analysis

The data collected was recorded in the Excel database and processed by the Stata 12 software with the calculation of the proportion at the start and end of the program in order to make a comparative analysis over the two periods.

3. Results

3.1. Evolution of the state of fatigue of women undergoing treatment for breast cancer

The information provided by women treated for breast cancer, concerning their state of fatigue, is presented in Figure 1.

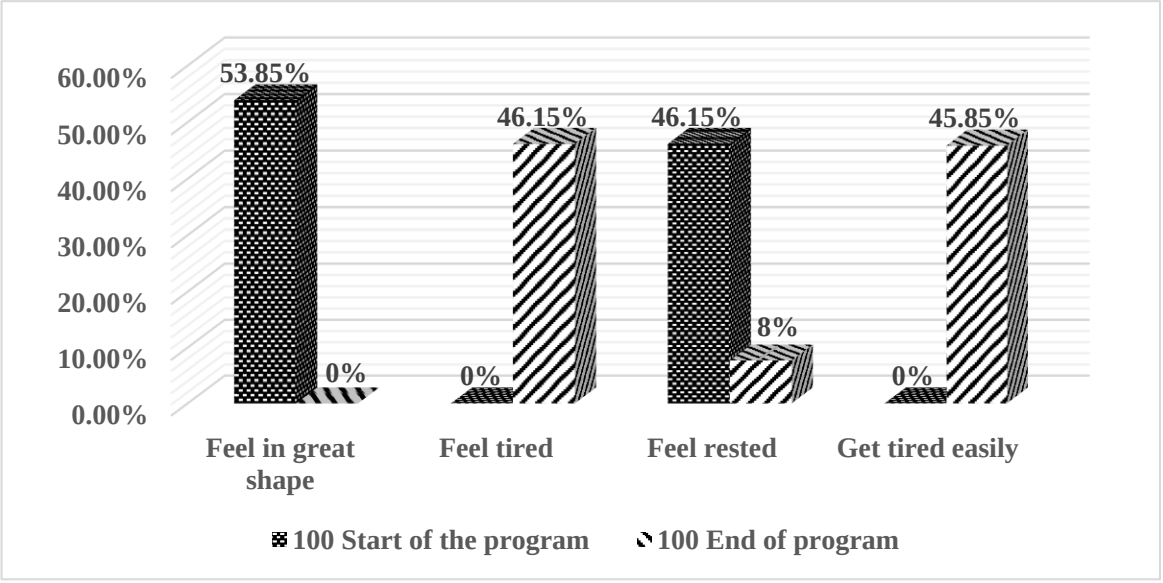

Figure 1. Evolution of the state of fatigue of women undergoing treatment for breast cancer.

It is clear from the analysis of Figure 1 that at the start of the program, the situation is critical. 46.15% felt tired. Similarly, 45.85% of women said they tire easily. At the end of the program, more than half of the women (53.85%) believe they feel fit. The remaining 46.15% of women say they feel rested. This evolution reveals an improvement in the state of fatigue of these women. The practice of AP would therefore have had a positive impact on fatigue.

3.2. Evolution of the physical condition of women undergoing treatment for breast cancer

Data related to the physical condition of women in this research at the start and end of the program are shown in Figure 2.

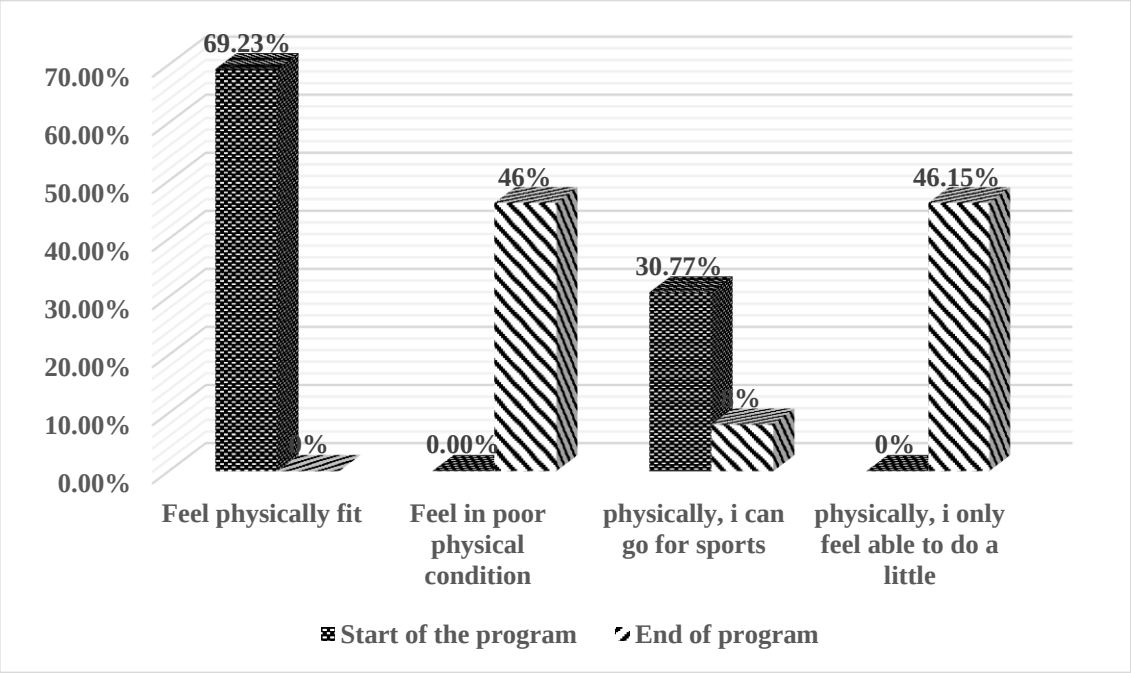

Figure 2. Evolution of the physical condition of women undergoing treatment for breast cancer

From reading Figure 2, it should be remembered that at the start of the program, 46.15% of women believe that they are in good physical shape, 46.15% of them think that physically, they only feel capable to do some sport. Only 7.69% of women believe that physically they can play sports. However, at the end of the program, 69.23%, or more than half, said they were in good physical shape. The remaining 30.77% of women believe that physically they can play sports. These proportions reveal an improvement in the physical condition of women.

3.3. Quality of life of women undergoing treatment for breast cancer

The women's ability to perform daily tasks at the start and end of the program is shown in Figure 3.

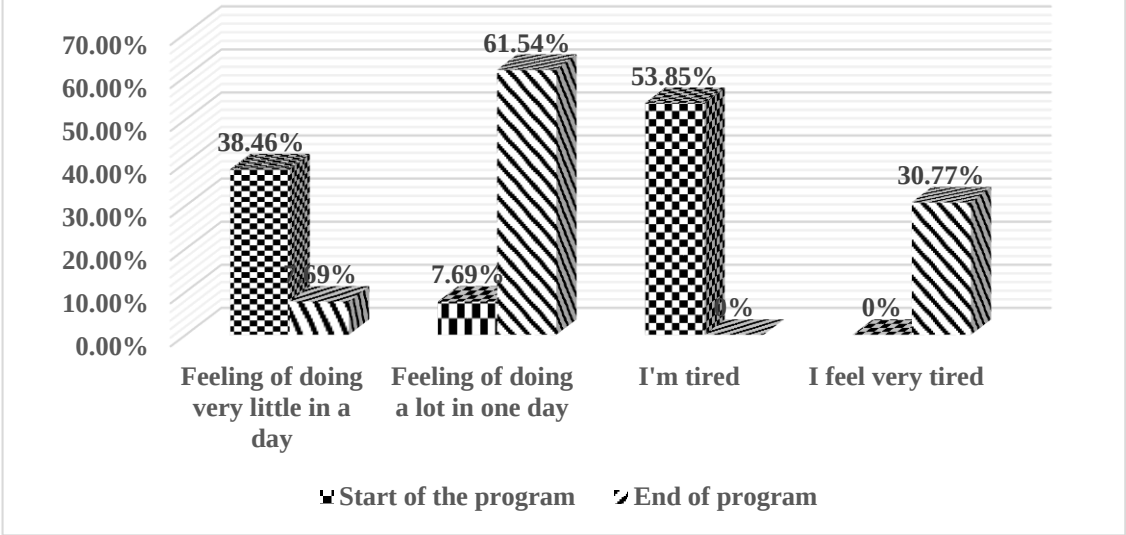

Figure 3. Evolution of the ability of women undergoing treatment for breast cancer to perform tasks on a daily basis.

It appears from the analysis of Figure 3 that at the start of the program, 38.46% believe that they can do very little effort in one day; 53.85% of them feel tired and the remaining 7.69% say they can do a lot in one day. On the other hand, at the end of the program, 61.54% of the women affirmed that they can do a lot of things in one day, 30.77% of them feel very active. It's only the remaining 7.69% who felt they could do very little effort in a day. The physical exercise program would therefore have allowed the women to increase their ability to perform tasks on a daily basis.

With regard to the psychological fatigue of patients, the information provided by the surveys is shown in Figure 4.

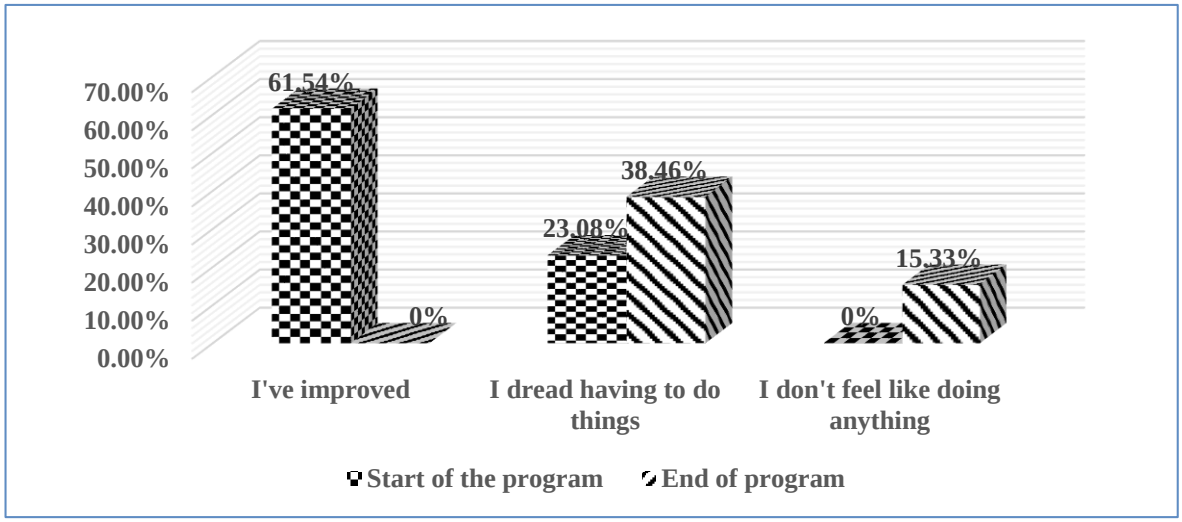

Figure 4. Evolution of psychological fatigue in women undergoing treatment for breast cancer.

It should be remembered from Figure 4 that at the start of the program, 61.54% of women in treatment did not want to do anything. The remaining 38.46% dread having to do things. On the other hand, at the end of the program, 61.54%, or more than half of the women, felt that they had made progress.

With regard to the concentration capacity of the women in treatment at the beginning and at the end of the program, it is presented in Figure 5.

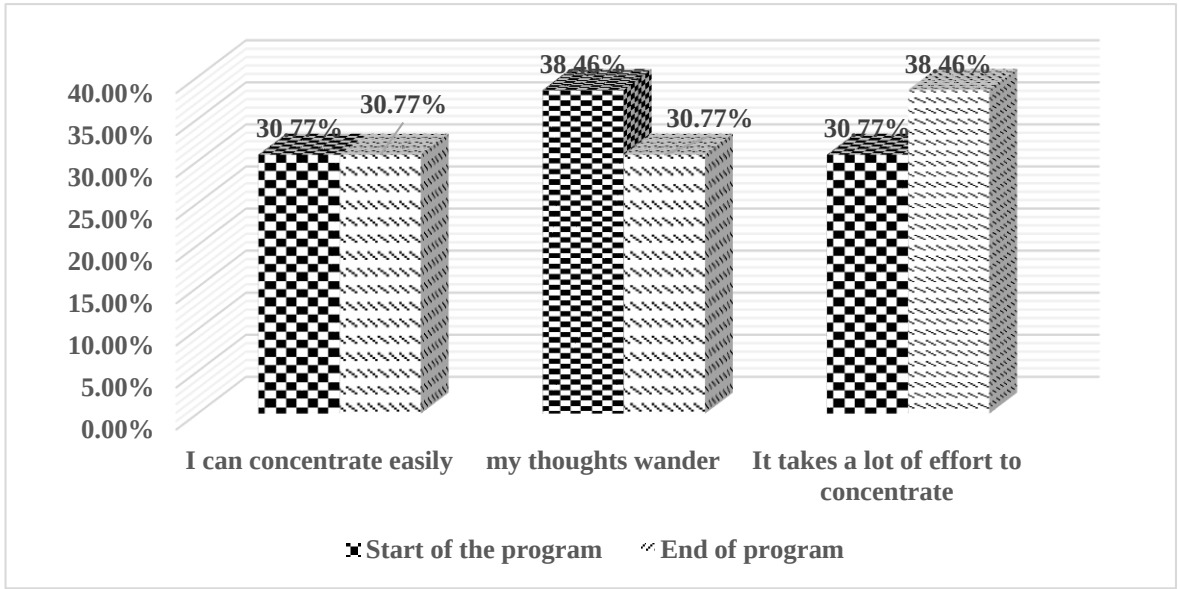

Figure 5. Evolution of the ability to concentrate of women undergoing treatment for breast cancer.

Figure 5 shows that at the start of the program, 38.46% of women have thoughts that wander easily; 30.77% of them believe that it takes a lot of effort to concentrate and for the remaining 30.77%, concentration is easy. At the end of the program, it takes a lot of effort for 38.46% of women to concentrate; 30.77%'s thoughts wander easily and 30.77% of them can concentrate easily. The difference in the ability to concentrate between the beginning and the end of the exercise program is not very apparent. It would seem that the practice of physical exercise had no significant impact on the cognitive fatigue of women undergoing treatment for breast cancer.

3.4. Assessment of overall physical condition

The evolution in the overall physical state of the women in treatment with reference to the past week is shown in Figure 6.

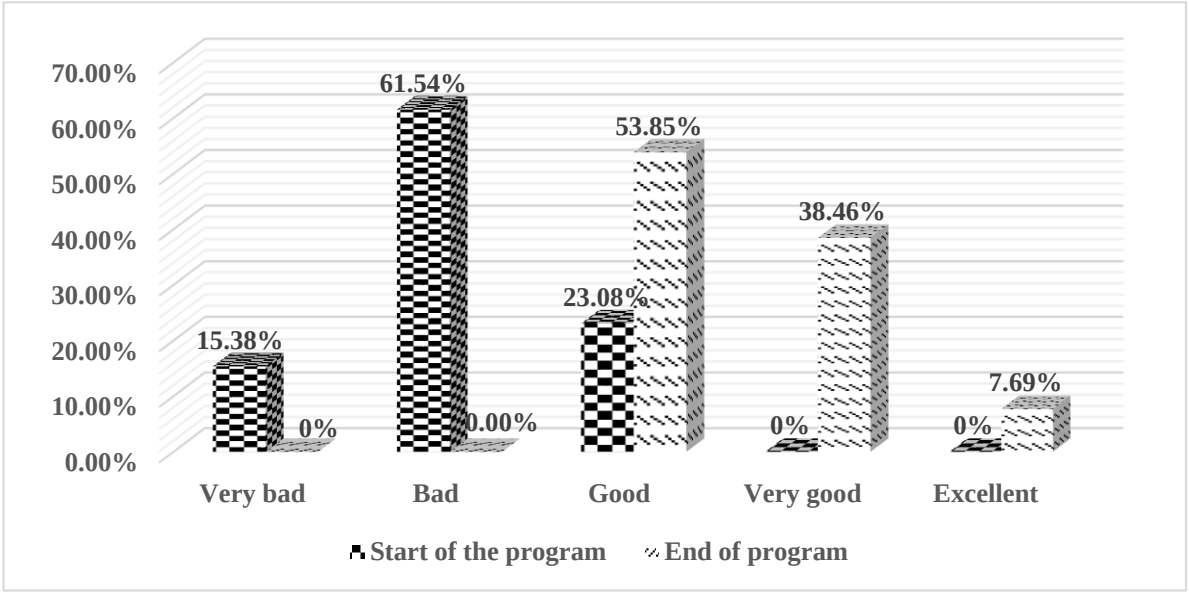

Figure 6. Evolution of the physical condition of women undergoing treatment for breast cancer

At the beginning of the program, referring to the week they had spent; 61.54% of the women declared to have a bad physical state and 15.38% of them a very bad physical state. Only 23.08% of women claimed to have good physical condition. But at the end of the program, 53.85% of the women felt that they were in good physical condition; 38.46% say they have a very good physical condition and for 7.69% of women it is excellent. The practice of physical exercise would therefore have contributed to improving the physical condition of women treated for breast cancer.

As for the evolution of their quality of life, it is presented in Figure 7 below.

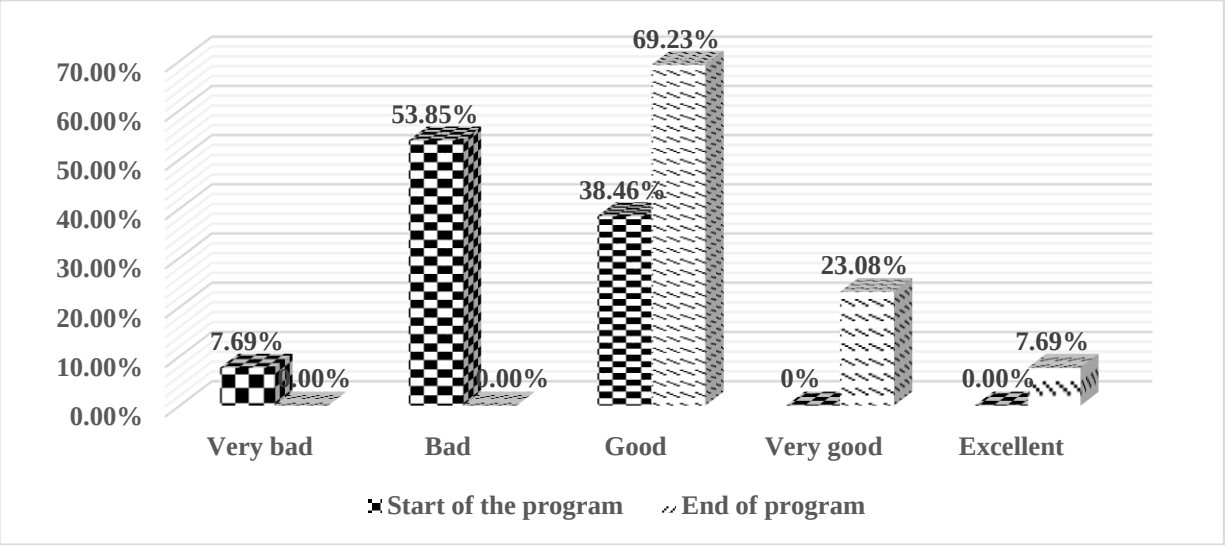

Figure 7. Evolution of the quality of life of women treated for breast cancer.

At the start of the program, only 38.46% of women claimed to have a good quality of life. All the others declared having a bad QoL (53.85%) or 7.69% a very bad QoL. But at the end of the program, we see that the quality of life of the subjects has improved considerably. The exercise program would therefore have had a positive effect on the quality of life of women treated for breast cancer.

4. Discussion

Breast cancer is a serious disease that affects women and complicates their daily lives. The majority of women participating in this study are very young (-30 years old), have stopped all physical exercise after the diagnosis of breast cancer (only 2 women have a regular practice of physical activity); fairly common behavior among women in this situation. This study aims to evaluate the effect of a physical exercise program on the physical and psychological state of young women under the age of 30 undergoing treatment for breast cancer in the city of Porto-Novo.

To do this, data collection was carried out in two stages; in women treated for breast cancer. The first concerns the initial situation of women and the second concerns the situation of women after being subjected to a physical exercise program consisting of stretching, walking and muscle-strengthening exercises; 2 times a week for 8 weeks. To design this program, we were inspired by the official recommendations of the WHO concerning the practice of physical exercise by people suffering from cancer and/or chronic diseases. The objective is to compare the different parameters before and after the program. This assumes that the data was collected with two collection sheets and a semi-interview with our patients.

Following our work on the 13 young women of the city of Porto-Novo, we can retain that before the program, as shown in Figure 1; women treated for breast cancer reported being very tired. This is the symptom most frequently reported by cancer patients, found in 100% of our patients from the start of treatment [41]. Fatigue significantly interferes with daily life and impairs patients' quality of life [42-43]. But at the end of the program, the majority of patients believe they feel in good shape. The physical fatigue they felt has decreased considerably. Physical activity allows a significant improvement in the manifestations of fatigue. This shows that the physical exercise program allowed effective management of the fatigue felt by our patients before the start of the experiments. These results agree with those of the work of Velthuis [44] and Cramp [41]. Cramp's results [41] showed that physical activity is the best and only cure for fatigue, which is a very common

symptom in breast cancer patients. It demonstrated that physical activity significantly improved fatigue in patients during and after their treatment. The work of Velthuis [44] has shown that physical activity in patients with breast cancer acts on the level of fatigue, which can be reduced by 36% during cancer treatment and by 37% after the end of treatment. . In their meta-analyses, Dennett [45]. McNeely [46] and Ibrahim [47] show that a physical exercise program contributes to a significant reduction in the feeling of fatigue in patients. In addition, Figure 4 indicates that at the end of the program, 61.54% of our patients, i.e. more than half of the women, declared that they had overcome the feeling of doing nothing and were engaged in their daily and social activities. -professionals. Our results are consistent with those of McNeely [46] who showed that physical fatigue and psychological fatigue seem to improve considerably in patients with physical activity. As for Speck [32] after treatment, he noted a significant effect of physical activity on muscle strength and moderate effects on fatigue and anxiety.

In addition, women with breast cancer believe that they are not in good physical condition at the start of the program, they have little stamina, get out of breath easily, and some joints are painful; while at the end, according to Figures 2, 6 and 7, the women claim to feel in better physical shape (69.23%) and the majority believe they are able to perform more tasks (92.31%). These results agree with those of Markes [27], May [28] and Musanti [48]. Indeed, these studies testify to the positive effects on physical factors (cardiorespiratory capacity, general physical conditions: strength, flexibility, muscular endurance, balance, etc.), of the practice of APA during and after treatments. Other studies have found an improvement in muscle qualities, especially in the lower limbs, upper limbs and pectorals. Muscular endurance increases [49].

Also, the BMI of 46.15% of the young women in our sample decreased slightly at the end of the physical exercise program; this decrease may have contributed to the feeling of well-being experienced by the women at the end of the program. The physical exercise program therefore caused the reduction of the BMI of the patients. The continuation of this long-term program could have a greater impact on the BMI of patients, especially those who are overweight. These results are congruent with those of Adam [50] who showed that the practice of physical activity reduces fat mass and insulin production. However, overweight and insulin increase the free fraction of estrogens.

The physical exercise program would therefore have contributed to improving the physical condition and quality of life of young women undergoing treatment for breast cancer.Our results agree with the results of the work of Romieu et al. [51] who demonstrated an improvement in quality of life, a decrease in anxiety and depression and a change in pain response. According to the authors, physical activity actually increases muscle mass, reduces fatty tissue and improves cardiovascular capacity [51, 52]. It will therefore have an impact on the quality of life since the patient will retain greater autonomy and ease in carrying out her daily activities. Another study, that of Mirandola [53], revealed that after an 8-week physical exercise program, it was observed that women are less painful and the quality of life questionnaires have better results, in particular the items concerning the body image.

According to the data observed and the feedback from the patients at the end of this research, the program seems to have been beneficial for most of them. This shows the importance of physical activities in the care of women suffering from breast cancer. Indeed, among the many means available to women with breast cancer and which relate to lifestyle habits, physical activity and weight maintenance are the first protective factors to consider if we want to try reduce the risk of recurrence and the mortality rate, according to a meta-analysis of 67 studies published in the Canadian Medical Association Journal. Of all the lifestyle factors, physical activity remains the one that has the most significant effect in reducing the risk of mortality [51]. It helps prevent overweight and obesity, known risk factors for certain cancers, which can also increase the risk of recurrence; it modulates the production of certain hormones and growth factors, such as insulin, IGF-1,

leptin and adiponectin (secreted by fat cells) that are involved in tumor growth; it boosts the immune system, thereby supporting natural defenses against cancer cells; it accelerates intestinal transit, reducing the exposure of the digestive mucosa to carcinogens from our diet [54]. During treatment (and from the start when possible), regular physical activity contributes to a better quality of life for patients, even when they did not practice it: it reduces fatigue, depressive episodes, improves sleep and body image; it decreases the risk of sarcopenia (decrease in muscle mass) which can increase the toxicity of chemotherapy; it allows better compliance with the monitoring of treatments by improving their tolerance and reducing their possible side effects.

In the longer term, the practice of physical activity after diagnosis of breast cancer reduces the risk of recurrence by 24%, and the risk of death from cancer by 28% [55]. After the illness, doctors recommend the practice of a physical activity which must be adapted to the state of health of each person. It helps fight "physical deconditioning", a decrease in physical performance related to illness and treatment. It strengthens social bonds and makes you feel less isolated. Adapted physical activity is beneficial and does not cause pain: for example, in breast cancer, adapted arm movements have no negative impact on lymphedema (the "fat arm" syndrome) and can instead improve mobility. In 2011, the Haute Autorité de Santé recognized physical activity as a non-drug therapeutic option, thus justifying its integration into the course of care.

5. Conclusion

Current data from the literature show an increasingly certain benefit for the practice of physical exercise during breast cancer treatment for women over 40 years of age. Indeed, physical activity reduces the risk of recurrence, overall mortality and specific mortality of breast cancer. It would tend to reduce fatigue and improve self-esteem, self-image, tolerance to treatment and quality of life of patients. Our objective through this study is to study the positive effects that a physical exercise program could have in the physical and psychological care of 13 young women under 30 undergoing treatment for breast cancer.

Our results showed that the physical exercise program improved the physical and psychological state of young women under 30 undergoing treatment for breast cancer in the Saint Nicolas clinic in Porto-Novo. Indeed, the program has improved the quality of life of the patients by considerably reducing the fatigue and the pain felt. Similarly, it significantly improved physical abilities, concentration abilities, physical state and anxiety in our patients. There was also a marked improvement in the ability to concentrate and self-esteem. In a nutshell, we can conclude that physical activities had practically the same beneficial effects observed in patients over 40, on our young women under 30 living in Africa and more specifically in Benin.

However, to reach more extensive conclusions, a complementary study would be necessary with a larger number of people. An objective evaluation of the benefits on physical abilities could be interesting. Flexibility, endurance and balance could now be studied with patients not participating in the program as controls would be useful.

Credit Authorship Contribution Statement

Lafiou YESSOUFOU: Conceptualization, Methodology, Investigation, Formal analysis, Data curation, Writing – original draft, Writing – review & editing, Validation

Gérard Sèmako DOSSOU: Conceptualization, Methodology, Investigation, Formal analysis, Data curation, Writing – original draft, Writing – review & editing, Validation.

Mohamed Mansourou LAWANI: Conceptualization, Methodology, Investigation, Formal analysis, Writing – original draft, Writing – review & editing, Validation.

Nawal TIGRI: Conceptualization, Methodology, Investigation, Formal analysis, Writing – original draft, Writing – review & editing, Validation.

Gratien Vignon HOUETO: Conceptualization, Methodology, Investigation, Formal analysis, review & editing, Validation.

Neddy Ornella Mahugnon AGBAYAHOUN: Conceptualization, Methodology, Investigation, Formal analysis, Writing – original draft, Writing – review & editing, Validation.

Declaration of competing interest

All authors have indicated they have no financial relationships relevant to this article to disclose.

The authors have no conflicts of interest relevant to this article to disclose.

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