Physical activity in women undergoing mastectomy and breast reconstruction

Nível de atividade física em mulheres mastectomizadas e submetidas a reconstrução mamária

ABSTRACT

Background: Regular physical activity has been recommended for the prevention and treatment of coronary heart disease, diabetes mellitus, and hypertension. Besides being a protective factor against breast cancer, physical activity following the diagnosis of breast cancer has been associated with an improved quality of life and survival. The aim of this study was to assess levels of physical activity in women who had undergone mastectomy without breast reconstruction and in women who had undergone breast reconstruction after breast cancer treatment. Methods: Two groups, each with 18 patients, comprised the patient series. One group comprised women who had undergone mastectomy without breast reconstruction, and the other group comprised women who had undergone mastectomy and breast reconstruction. All patients were aged between 18 and 60 years. The exclusion criteria were physical disability; illiteracy; ongoing chemotherapy, radiation therapy, or psychiatric therapy; and surgery performed within the previous 12 months. Study participants completed the International Physical Activity Questionnaire. Statistical analysis was performed by applying the chi-square and Student’s t tests, adopting a significance level of P < 0.05. Results: In the group of women who had undergone mastectomy without breast reconstruction, 16.7% were very active, 61.1% were active, and 22.2% were insufficiently active. In the group of women who had undergone mastectomy with breast reconstruction, 55.6% were very active, 33.3% were active, and 11.1% were insufficiently active. The difference between the groups was statistically significant (P < 0.0001). Conclusions: In this study, the level of physical activity among women who underwent breast reconstruction was higher than that among women who underwent mastectomy without breast reconstruction.

Keywords: Mammaplasty. Breast neoplasms. Quality of life. Questionnaires.

RESUMO

Introdução: A prática regular de atividade física tem sido recomendada para prevenção e tratamento de doenças coronárias, diabetes melito e hipertensão arterial. Além de fator protetor, a atividade física após o diagnóstico de câncer de mama tem sido correlacionada a aumento da qualidade de vida e da sobrevida. O objetivo deste estudo é avaliar o nível de atividade física de mulheres mastectomizadas sem reconstrução mamária e de mulheres submetidas a reconstrução mamária pós-tratamento de câncer de mama. Método: A casuística foi composta por 2 grupos, um de mulheres mastectomizadas sem reconstrução mamária e outro de mulheres mastectomizadas e submetidas a reconstrução mamária pós-mastectomia, ambos com 18 pacientes. Todas as pacientes tinham idade entre 18 anos e 60 anos. Os critérios de exclusão foram: deficiência física, analfabetismo, vigência de tratamento de quimioterapia, radioterapia ou psiquiátrico, e tratamento cirúrgico realizado em período inferior a um ano. As voluntárias responderam ao Questionário Internacional de...
INTRODUCTION

The relationship between physical activity and health is well known, and has been referred to in ancient Chinese, Indian, Greek, and Roman texts. However, a direct relationship between sedentary behavior and population mortality rates has only been established in the last 3 decades. Epidemiological studies have indicated a strong relationship between inactivity and the presence of cardiovascular risk factors such as hypertension, insulin resistance, non-insulin dependent diabetes, dyslipidemia, and obesity. Moreover, regular physical activity has been recommended not only for the prevention and treatment of the abovementioned diseases, but also for chronic diseases such as osteoporosis; certain cancers, such as colon and breast cancer; stress reduction; and to improve self-esteem. This relationship becomes evident in the reduction in sequelae, reduced need for hospitalization, and fewer medications needed to control these diseases, all of which reduce the costs associated with hospital medical services. Thus, physical activity alone can be considered an excellent option for cost containment in public health.

Currently, more than 2 million deaths worldwide could be avoided with exercise. In 2002, the Government of the State of São Paulo spent millions of dollars on sedentary lifestyle-related health problems, which equated to 3.6% of the state’s total health expenditure and more than half of the total hospital expenditure ($179.9 million); 10 health problems were primarily found to be associated with inactivity. Risk factors such as a lack of physical activity, smoking, and poor diet are directly related to lifestyle, and account for > 50% of the total risk of developing a particular chronic disease. These factors present a more decisive causal relationship than the combination of genetic and environmental factors. Among these factors, a sedentary lifestyle emerges as the most predominant risk factor in the population, regardless of sex.

Besides being a protective factor against breast cancer, physical activity following the diagnosis of breast cancer has been strongly correlated with improvements in the quality of life and increased survival in women with breast cancer. Studies by the World Health Organization’s (WHO) International Agency for Research on Cancer estimate that more active women have a 20%-40% lower risk of developing breast cancer. This finding has been explained by the decline in circulating ovarian hormones, which are closely linked to the development of the disease. Moreover, physical activity prevents weight gain during breast cancer treatment, which is a common adverse effect. This is important because being overweight is a risk factor for increased morbidity. However, despite the well-established association between regular exercise and health, this relationship has been questioned. Some authors interpret this association differently, arguing that some people exercise because they would like to present an image of better health and not the reverse, which characterizes the problem of “endogeneity.”

Cancer is defined as the uncontrolled growth and abnormal spread of cells in the body. Breast cancer is the most frequently diagnosed cancer in women. More than 190,000 women are diagnosed annually with breast cancer in the United States. The most common forms of treatment include surgery (lumpectomy or mastectomy), chemotherapy, radiation therapy, or hormonal therapy. Usually, more than 1 type of treatment is used in a complementary manner. Despite the therapeutic success obtained, side effects are frequently associated with the treatment administered, leading to major declines in functionality. Fatigue is the most commonly observed side effect, affecting at least 30% of patients. Declines in physical activity exacerbate the side effects, leading to patients experiencing recurrent adverse effects, which further aggravate the feelings of fatigue. The forced reduction in physical activity levels promotes the development of a pathological condition that, in association with other side effects, including the loss of appetite, can exacerbate physical decline and, subsequently, loss of overall muscle strength. The loss of muscle strength decreases the ability of patients with cancer to perform simple daily tasks, thus significantly compromising their quality of life. The causes of fatigue associated with cancer treatment should be viewed as multifactorial and related to both physical and emotional deterioration.

The diagnosis of cancer and its therapy greatly affect the psychological health of patients, especially when mutilating...
surgery is involved, and can even result in psychiatric sequelae\textsuperscript{28}. In the United States, approximately 69,000 women undergo mastectomy annually\textsuperscript{29}, and a similar rate has been reported in Great Britain\textsuperscript{30}. Mastectomy affects patients psychosocially and has impacts on various aspects of their quality of life, including self-image, self-esteem, and sexual relationships\textsuperscript{31}, in addition to being associated with high rates of depression\textsuperscript{32}.

In patients undergoing mastectomy, the major goal of reconstructive surgery is aesthetic rehabilitation – to remove the stigma associated with cancer and mutilation. A return to the precancerous state is fundamental to this process and the removal of muscle does not have a significant functional impact\textsuperscript{33}. A patient’s motivation and willingness are the main indications for reconstructive surgery, which reduces the feeling of deformity that develops after mastectomy.

Immediate breast reconstruction may be considered for patients with stages 0, I, and II of the disease\textsuperscript{34}. It is oncologically safe and is the most commonly indicated procedure, provided the histological results are satisfactory. Besides the obvious psychological benefit, preservation of body image is undoubtedly a good reason to encourage reconstruction. When reconstructions are performed by well-trained staff, the morbidity of such cases are not significantly greater as compared to cases that undergo mastectomy without reconstruction\textsuperscript{35}.

The incidence of breast reconstruction after mastectomy differs among countries and among hospitals within the same country. In the United States, the reconstruction rate was estimated at 8.3\% from 1994 to 1995\textsuperscript{29}, whereas in the United Kingdom and Ireland, it was estimated at 18\% in 2000\textsuperscript{30}. In other industrialized countries, some specialized hospitals reported rates of \textgreater 50\%\textsuperscript{36}. For women who undergo mastectomy, breast reconstruction usually improves their quality of life and the psychosocial aspects of life without diminishing their chances of survival, regardless of disease stage\textsuperscript{37}.

A positive relationship exists between the quality of life and plastic surgery, even though few studies examining this association have been published. Veiga et al.\textsuperscript{38} showed that reconstruction using the rectus abdominis muscle flap (the transverse rectus abdominis myocutaneous [TRAM]) improved the quality of life of patients. Brandberg et al.\textsuperscript{39} described similar results.

The aim of this study was to evaluate levels of physical activity in women who had undergone mastectomy without breast reconstruction and in women who had undergone breast reconstruction following mastectomy.

METHODS

Data were collected from the breast reconstruction and mastology outpatient clinics of the Gynecology Department of the Federal University of São Paulo (UNIFESP). Both outpatient clinics are located within the complex of the Hospital São Paulo, a teaching hospital of the UNIFESP.

The patient series comprised 2 groups, each with 18 subjects. One group comprised women who underwent mastectomy without breast reconstruction, and the other group comprised women who underwent mastectomy with breast reconstruction. Patients were interviewed and a form pertaining to their clinical data was completed. Only those patients who completed and signed a consent form participated in the study. The following inclusion criteria were used for the 2 study groups:

- Women who had undergone mastectomy without breast reconstruction who were aged between 18 and 60 years, and were not being treated with radiation or chemotherapy, or receiving psychiatric treatment.
- Women who had undergone mastectomy with complete breast reconstruction who were aged between 18 and 60 years, and were not receiving psychiatric treatment.

Patients who did not fit the inclusion criteria, or were illiterate, physically disabled, or had disabling sequelae preventing them from participating in physical activity, were excluded from the study.

Study participants were asked to complete the International Physical Activity Questionnaire (IPAQ) developed by the WHO in 1998. This self-administered questionnaire includes questions on the activities performed during a typical week. Activities at work, home, leisure, and during movement from one place to another are recorded. On average, the questionnaire takes 10 min to complete. This questionnaire has been translated into Portuguese and validated for use in Brazil\textsuperscript{40}.

This instrument has been successfully applied to assess levels of physical activity in different populations\textsuperscript{41}, including a multicenter study analyzing physical activity in individuals from 20 countries\textsuperscript{42}, a study of patients with multiple sclerosis\textsuperscript{43}, a comparative pre- and postoperative study of arthroplasty\textsuperscript{44} in women after the diagnosis of breast cancer\textsuperscript{45}, and a study of schizophrenic patients\textsuperscript{46}.

IPAQ Rating

Following the tabulation and evaluation of patient data, participants were classified according to the following IPAQ categories:

- Sedentary: does not perform any physical activity for at least 10 min continuously each week;
- Insufficiently active: is physically active for at least 10 min continuously per week, but not in a manner that could be classified as active. To assign individuals to this category, the duration and frequency of different types of activities (walks, moderate activity, and vigorous activity) are summed. This category is divided into 2 groups:
of women who had undergone mastectomy without breast reconstruction were paid workers, whereas 27.8% of those who had undergone mastectomy with breast reconstruction were paid workers. The patients who had undergone mastectomy without breast reconstruction had a mean of 9.38 ± 4.25 years of schooling, whereas those who had breast reconstruction following mastectomy had a mean of 10.67 ± 4.32 years of schooling. These data are summarized in Table 1.

Statistical analysis was performed by applying the chi-square test, adopting a significance level of P ≤ 0.05.

RESULTS

We interviewed 36 patients, including 18 who had undergone mastectomy without breast reconstruction and 18 who had undergone mastectomy with breast reconstruction.

In the group of women who had undergone mastectomy without breast reconstruction, 16.7% were very active, 61.1% were active, and 22.2% were insufficiently active. In the group of women with breast reconstruction following mastectomy, 55.6% were very active, 33.3% were active, and 11.1% were insufficiently active. The difference between the groups with respect to the levels of physical activity was statistically significant (P < 0.0001) (Figure 1).

The mean age of the patients was 49.37 ± 6.63 years. The women who had undergone mastectomy without breast reconstruction had a mean age of 50.2 ± 5.98 years. The women who had undergone mastectomy with breast reconstruction had a mean age of 48.53 ± 7.33 years. The difference between the mean ages of the 2 groups was not statistically significant (P = 0.5005).

The average time after surgery was 38.2 ± 25.1 months in the group that had undergone mastectomy without breast reconstruction and 62.75 ± 12.79 months in the group who had undergone breast reconstruction following mastectomy. Among the patients who underwent mastectomy without breast reconstruction, 66.7% were married, whereas, among the patients who had breast reconstruction following mastectomy, 61.1% were married.

The women who had undergone mastectomy without breast reconstruction and those who had undergone mastectomy with breast reconstruction, had a mean of 1.82 ± 1.17 children and 1.5 ± 1.29 children, respectively. In total, 38.9% of women who had undergone mastectomy without breast reconstruction were paid workers, whereas 27.8% of those who had undergone mastectomy with breast reconstruction were paid workers. The patients who had undergone mastectomy without breast reconstruction had a mean of 9.38 ± 4.25 years of schooling, whereas those who had breast reconstruction following mastectomy had a mean of 10.67 ± 4.32 years of schooling. These data are summarized in Table 1.

Figure 1 – Distribution of physical activity in women who underwent mastectomy with and without breast reconstruction.
repercussions on the physical activity of these patients. This is corroborated by the fact that in the current study, more women in the group who had undergone breast reconstruction following mastectomy were classified as being very active and active, compared with the group who had not undergone breast reconstruction following mastectomy. To our knowledge, none of the published studies have assessed the levels of physical activity in women who have undergone mastectomy and breast reconstruction.

The main difficulties in recruiting participants for this study were age and the amount of time that had lapsed following surgery. The upper age limit for inclusion in the study was established to avoid bias in relation to the physical activity associated with bodily limitations. Many of our patients are aged > 60 years and could not be included in the study. With regard to the length of the postoperative period, many of our patients had undergone surgery within the previous 12 months. In addition, some patients were unable to participate because they were illiterate.

Patients were carefully selected and we aimed to obtain 2 homogeneous groups. Internally, the groups were quite heterogeneous, both in relation to age and socially, which reflects the composition of the population in general.

We can infer from the results of the current study that if there was adequate educational and psychological support for patients undergoing breast cancer treatment, they would be better equipped to deal with this phase, with fewer losses in terms of quality of life and their overall health. Therefore, policies aimed at creating this type of support are needed.

**CONCLUSIONS**

The level of physical activity among women who underwent breast reconstruction following mastectomy is higher than that among women who underwent mastectomy without breast reconstruction.

**REFERENCES**


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**Table 1 – Characteristics of the study groups.**

<table>
<thead>
<tr>
<th></th>
<th>Mastectomy without breast reconstruction</th>
<th>Mastectomy with breast reconstruction</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age (years)</strong></td>
<td>50.20 ± 5.98</td>
<td>48.53 ± 7.33</td>
</tr>
<tr>
<td><strong>Marital status (%)</strong></td>
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<tr>
<td>Married</td>
<td>66.7</td>
<td>61.1</td>
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<tr>
<td>Single</td>
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<td>27.8</td>
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<tr>
<td>Separated</td>
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<td>11.1</td>
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<tr>
<td>Widowed</td>
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<tr>
<td><strong>Paid employment (%)</strong></td>
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<tr>
<td>Yes</td>
<td>38.9</td>
<td>27.8</td>
</tr>
<tr>
<td>No</td>
<td>61.1</td>
<td>66.7</td>
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<tr>
<td>Abstain</td>
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<tr>
<td><strong>Number of children</strong></td>
<td>Mean ± standard deviation</td>
<td></td>
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<tr>
<td></td>
<td>1.82 ± 1.17</td>
<td>1.50 ± 1.29</td>
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<tr>
<td><strong>Time after surgery (months)</strong></td>
<td>Mean ± standard deviation</td>
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<tr>
<td></td>
<td>38.20 ± 25.10</td>
<td>62.75 ± 12.79</td>
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<tr>
<td><strong>Years of schooling</strong></td>
<td>Mean ± standard deviation</td>
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<td>9.38 ± 4.25</td>
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Correspondence to: Miguel Sabino Neto
Rua Napoleão de Barros, 715 – 4º andar – Vila Clementino – São Paulo, SP, Brazil – CEP 04024-002
E-mail: msabino@uol.com.br


