UNIVERSITY of LIMERICK

OLLSCOIL LUIMNIGH

Final Year Project Title (Proposal): **The Effects of Exercise on Breast Cancer**

University of Limerick: DEHF SS3063

Supervisor: Noreen O'Connell

Student ID: 16220943

Student Name: Siobhan Fagan

Paper due date: 1st November 2018

Submitted in part fulfilment of the requirements for the Diploma in Exercise and Health Fitness.

The Effects of Exercise on Breast Cancer

Introduction:

There are over 1 million women diagnosed with breast cancer every year globally. Even though the 5-year survival rate for breast cancer patients increased from 75.1% (from 1975-1977) to 90% (2001-2007), breast cancer still has the highest amount of cancer rates and deaths in women. (Schmid and Leitzmann 2014; Hayes *et al.* 2013)

This type of cancer arises in the mammary gland (Oxford Dictionary, 2018) and is the most common form of cancer in women around the world. Representing up to 23% of all cancer cases. (Zeng *et al.* 2014) and in the United States it accounts for the second leading cause of cancer death. (Zhong *et al*. 2014)

Treatment for breast cancer varies case to case, but may include; surgery, chemotherapy, radiotherapy as well as endocrine therapies. As survivorship rates have now began to increase, so has treatment related side effects such as; fatigue, weight gain, depression, bone loss, inflammation and lymphedema to name but a few. Many of these unpleasant effects from treatment are often linked with decreased exercise levels. Which sequentially can lead to greater mortality amongst this population. (Cheema *et al.* 2014)

Furthermore, survivors of breast cancer are at increased risk of secondary cancers, reoccurrence, as well as premature death. So, it's absolutely crucial that treatment is specific to the individual to decrease mortality rate. (Zhong *et al*. 2014)

Studies have shown that breast cancer survivors that engage in regular physical activity experience less sides effects through treatment, an improved quality of life and decreased risk of cancer recurrence. Unfortunately, research has also indicated that up to 70% of breast cancer survivors fail to undertake the recommended exercise guidelines of 150 minutes per week (moderate to vigorous intensity). (Phillips *et al.* 2015)

One of the most common cancer related symptoms in breast cancer survivors and patients is fatigue. This stressful symptom effects approximately 40-80% of patients undertaking treatment. Although physical activity has been proven to increase quality of life and improve cancer related fatigue, the effects and type of exercises themselves require more research. (Meneses-Echávez *et al*. 2015)

Steindorf *et al*. (2014) similarly agrees that exercise decreases cancer related fatigue and overall improves quality of life, however there's minimal findings on physical activity during treatment or a style of exercise best suited (resistance training in this instance is looked at). Most randomised exercise trials looked at only aerobic or aerobic *with* resistance training, yet research by Steindor *et al.* in 2014 suggests trials on muscle strengthening alone is quite scarce. However, upon further research; Courneya *et al*. (2014) investigates aerobic exercise versus resistance training.

Another thing to consider is how soon from diagnosis should exercise start, interestingly, Travier *et al*. (2015) examines whether starting exercise shortly after prognosis may avoid or reduce fatigue during treatment.

I propose that the purpose of this paper is to examine the overall effect of physical activity on breast cancer. Looking at; throughout treatment and post treatment. As well as analysing the effect of all types of exercise, from resistance training, to cardio and flexibility. What type of effect does physical activity have on breast cancer patients and survivors in general? Do they improve or decrease the sides effects or symptoms related from cancer treatment? If so, specifically, which ones? Does it decrease the mortality rate or chances of reoccurrence? Although it's commonly mentioned that physical activity improves quality of life, I want more details and information specifically to the female breast cancer population.

Although there's going to be other factors to consider such as; treatment received, tumour size, grade, family history, stage, hormonal, her 2 positive/negative for instance (Courneya, 2014). From analysing multiple randomised clinical trials an overall observation should be clear on the impact between physical activity and breast cancer in women.

Purpose:

Aims:

My aim by the end of this project is to achieve the following;

- I endeavour to complete a well written thesis on my chosen subject.
- I hope to understand how exercise impacts breast cancer during and post treatment.
- I'd like to know how physical activity effects the unpleasant symptoms from breast cancer treatment.
- Have a clear understanding if strength training (LME), Cardiovascular or Flexibility (or perhaps all three) are best suited to someone suffering from breast cancer.
- Be knowledgeable in post treatment implications on health that may play a part in how someone with breast cancer exercises (i.e. mastectomy and the implications this may have on movement/ discomfort etc.)
- Know how much of an impact physical activity has on cancer reoccurrence.
- Be aware of how exercise effects survival rates/mortality rates.
- Understand the main symptoms of treatment and whether exercise impacts each one (for example; fatigue which is one of the most common).
- Be aware of the various factors that all impact results of the various clinical trials I'll be researching. So, I'll understand that one size doesn't fit all.

Objectives:

To achieve the above goals, I will follow the steps below to achieve my desired outcome:

- Gather research via journals, books and online articles online and from the library.
- Utilise the appropriate tools to gather this information (i.e. Scopus, Web of Science, Ebsco, Google Scholar etc.)
- Using a selection of the appropriate keywords for my search strategy to narrow down the required information.
- Spend enough time reading abstracts and pulling the useful information from various journals/studies.
- Narrow down the main papers appropriate to my project.
- Read through all papers, taking note of clinical trials and their outcomes.
- Highlighting any key points that touch on some of my unanswered questions from my aims.
- Examining any additional reading that may come as a result from another study.
- Organise my findings appropriately to their headings (i.e. whether during treatment/post treatment/symptom etc.)
- Structure my project accordingly to ensure it flows smoothly from introduction through to conclusion.
- Make sure I've structured correct as per FYP guidelines.
- Review my 'Cite It Right' book to ensure my referencing and citing is correct.
- Ensuring enough information is allocated according to grading percentages.
- Time management - Allocating my time wisely to balance additional study time, FYP, work and my own physical activity.

Proposed Project Timeline *(to be confirmed)*

Task:	**Deadline:**	**Completed**
Proposal submitted.	1st November	☒
Feedback from proposals reviewed.	6th November	☐
Template /Structure designed.	20th November	☐
Literature review of main research completed.	20th December	☐
Additional literature review *(i.e. extra reading found from main review)*	31st December	☐
Chapters organised accordingly. *(Table of contents)*	1st January	☐
Advice from supervisor *(run through to ensure I'm on right track)*	Mid Jan	☐
Initial draft: *(Main skeleton of the thesis should be complete.)*	20th February	☐
Abstract completed.	1st March	☐
Introduction checked over. *(as main content may change as research is finished)*	10th March	☐
Spelling / Grammar / Reference check.	20th March	☐
Friends/Family read through.	25th March	☐
Final review/editing. *(Proof read)*	4th April	☐
Submission.	11th April	☐

List of References to date: *(more to be examined for the final paper).*

Cheema, B.S., Kilbreath, S.L., Fahey, P.P., Delaney, G.P. and Atlantis, E. (2014) 'Safety and efficacy of progressive resistance training in breast cancer: a systematic review and meta-analysis' *Breast Cancer Res Treat*, 148, 249–268.

Courneya, K.S., Segal, R.J., Mckenzie, D.C., Dong, H. Gelmon, K., Friedenreich, C.M., Yasui, Y., Reid, R.D., Crawford, J.J. and Mackey, J.R. (2014) 'Effects of Exercise during Adjuvant Chemotherapy on Breast Cancer Outcomes' *Official Journal of the American College of Sports Medicine*, 46(9), 1744–1751.

Hayes, S.C., Rye, S., DiSipio, T., Yates, P., Bashford, J., Pyke, C., Saunders, C., Battistutta, D. and Eakin, E. (2013) 'Exercise for health: a randomized, controlled trial evaluating the impact of a pragmatic, translational exercise intervention on the quality of life, function and treatment-related side effects following breast cancer' *Breast Cancer Res Treat*, 137, 175-186.

Meneses-Echávez, J.F., González-Jiménez, E. and Ramírez-Vélez, R. (2015) 'Effects of supervised exercise on cancer-related fatigue in breast cancer survivors: a systematic review and meta-analysis' *BMC Cancer*, 15:77.

Phillips, S.M., Dodd, K.D., Steeves, J., McClain, J., Alfano, C.M. and McAuley, E. (2015) 'Physical activity and sedentary behaviour in breast cancer survivors: New insight into activity patterns and potential intervention targets' *Gynecologic Oncology*, 138, 398–404.

Schmid, D. and Leitzmann, M.F. (2014) 'Association between physical activity and mortality among breast cancer and colorectal cancer survivors: a systematic review and meta-analysis' *Annals of Oncology*, 25(7), 1293–1311.

Steindorf, K., Schmidt, M.E., Klassen, O., Ulrich, C.M., Oelmann, J., Habermann, N., Beckhove, P., Owen, R., Debus, J., Wiskemann, J. and Potthoff, K. (2014) 'Randomized, controlled trial of resistance training in breast cancer patients receiving adjuvant radiotherapy: results on cancer-related fatigue and quality of life' *Annals of Oncology*, 25, 2237–2243.

Travier, N., Velthuis, M.J., Steins Bisschop, C.N., van den Buijs, B., Monninkhof, E.M., Backx, F., Los, M., Erdkamp, F., Bloemendal, H.J., Rodenhuis, C., de Roos, M.A.J., Verhaar, M., ten Bokkel Huinink, D., van der Wall, E., Peeters, P.H.M. and May, A.M. (2015) 'Effects of an 18-week exercise programme started early during breast cancer treatment: a randomised controlled trial' *BMC Medicine*, 13:121.

Zeng, Y., Huang, M., Cheng, A.S.K., Zhou, Y. and So, W.K.W. (2014) 'Meta-analysis of the effects of exercise intervention on quality of life in breast cancer survivors' *Breast Cancer*, 21, 262–274.

Zhong, S., Jiang, T., Ma, T., Zhang, X., Tang, J., Chen, W., Lv, M. and Zhao, J. (2014) 'Association between physical activity and mortality in breast cancer: a meta-analysis of cohort studies' *Eur J Epidemiol*, 29, 391–404.

Bibliography:

Oxford Dictionary 2018
https://en.oxforddictionaries.com