NURSES BELIEFS ON BENEFITS AND BARRIERS TO PHYSICAL ACTIVITY PROMOTION FOR CANCER PATIENTS IN HOSPITAL UNIVERSITI SAINS MALAYSIA

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NURSES BELIEFS ON BENEFITS AND BARRIERS TO PHYSICAL ACTIVITY PROMOTION FOR CANCER PATIENTS IN HOSPITAL UNIVERSITI SAINS MALAYSIA

by

TEH HUI LI

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CERTIFICATE

This is to certify that the dissertation entitled "Nurses Beliefs on Benefits and Barriers to Physical Activity Promotion for Cancer Patients in Hospital Universiti Sains Malaysia" is the bona fide record of research work done by Ms Teh Hui Li, matric number 138502 during the period from October 2020 to June 2021 under my supervision. I have read this dissertation and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation to be submitted in partial fulfillment for the degree of Bachelor of Nursing (Honours).

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DECLARATION

I hereby declare that this dissertation is the result of my own investigations, except where otherwise stated and duly acknowledged. I also declare that it has not been previously or concurrently submitted as a whole for any other degrees at Universiti Sains Malaysia or other institutions. I grant Universiti Sains Malaysia the right to use the dissertation for teaching, research and promotional purposes.

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LIST OF ABBREVIATIONS

ACSM	-	American College of Sports Medicine
AICR	-	American Institute for Cancer Research
CIPN	-	Chemotherapy Induced Peripheral Neuropathies
CNE	-	Continuing Nursing Education
Hospital USM	-	Hospital Universiti Sains Malaysia
HREC	-	Human Research Ethics Committee
MET	-	Metabolic Equivalent
NCCN	-	National Comprehensive Cancer Network
PA	-	Physical Activity
SPSS	-	Statistical Package for Social Sciences
TPB	-	Theory of Planned Behavior
USM	-	Universiti Sains Malaysia
WCRF	-	World Cancer Research Fund
WHO	-	World Health Organization

KEPERCAYAAN JURURAWAT MENGENAI MANFAAT DAN HALANGAN TERHADAP PROMOSI AKTIVITI FIZIKAL UNTUK PESAKIT KANSER DI HOSPITAL UNIVERSITI SAINS MALAYSIA

ABSTRAK

Aktiviti fizikal bagi kebanyakan pesakit kanser masih belum mencukupi untuk mendapatkan faedah kesihatan; dan kesan sampingan dari rawatan yang berkaitan dengan kanser dapat mengurangkan aktiviti fizikal yang regular. Kajian ini bertujuan untuk mengetahui kepercayaan jururawat berkenaan faedah dan halangan terhadap promosi aktiviti fizikal bagi pesakit kanser di Hospital USM. Kajian keratan rentas dilakukan kepada 104 jururawat dari Januari 2021 hingga Mac 2021 dengan menggunakan kaedah persampelan rawak mudah. Soal selidik berstruktur dan telah disahkan digunakan untuk mengumpulkan data. Data dianalisis menggunakan perisian *Statistical Package for Social Science* (SPSS) versi 26.0. Ciri sosiodemografi dan tahap kepercayaan terhadap faedah dan halangan untuk mempromosikan aktiviti fizikal ditunjukkan dalam statistik deskriptif dan analisis korelasi Pearson serta ujian-T tidak bersandar digunakan untuk menentukan perkaitan antara kepercayaan jururawat mengenai faedah promosi aktiviti fizikal dan ciri sosio-demografi dengan tahap yang signifikan $p \leq .0.05$. Kajian ini mendapati bahawa sebahagian besar peserta mempercayai faedah promosi aktiviti fizikal terhadap pesakit kanser seperti meningkatkan kesihatan mental, 80.8% (n = 85). Kekurangan masa 30.8% (n = 32), pesakit kelihatan letih atau tidak memberikan kerjasama 20.2% (n = 21) dan kurang pengetahuan 16.3% (n = 17) adalah yang paling dipilih sebagai penghalang untuk mempromosikan aktiviti fizikal dalam kalangan peserta. Tiada hubungan yang signifikan antara kepercayaan terhadap faedah pada promosi aktiviti fizikal dengan usia (p = 0.908), pengalaman bekerja (p = 0.982), jenis wad (p = 0.666) dan jumlah purata pesakit kanser

yang dijaga dalam seminggu (p = 0.144). Kajian ini mendedahkan bahawa kepercayaan jururawat terhadap faedah promosi aktiviti fizikal terhadap pesakit kanser. Namun, terdapat halangan untuk mempromosikan aktiviti fizikal kepada pesakit kanser. Oleh itu, memperkukuhkan penyediaan maklumat kesihatan mengenai promosi aktiviti fizikal dengan merancang strategi dan penyesuaian untuk penyedia perkhidmatan kesihatan termasuk jururawat harus dipromosikan.

NURSES BELIEFS ON BENEFITS AND BARRIERS TO PHYSICAL ACTIVITY PROMOTION FOR CANCER PATIENTS IN HOSPITAL UNIVERSITI SAINS MALAYSIA

ABSTRACT

Physical activity for most cancer patients still insufficient to obtain health benefits; and adverse effects of cancer-related treatments may reduce regular physical activity. This study aims to determine the nurse's beliefs on benefits and barriers to physical activity promotion for cancer patients in Hospital USM. A cross-sectional study was conducted on 104 nurses from January 2021 to March 2021 by using a simple random sampling method. A structured self-administered, validated questionnaire was used to collect the data. The data were analyzed using the Statistical Package for Social Science (SPSS) version 26.0 software. The sociodemographic characteristics and level of beliefs on benefit and barriers to physical activity promotion were presented in descriptive statistics and Pearson correlation analysis and independent T test was employed to determine the correlation between nurses' beliefs on benefits of physical activity promotion and socio-demographic characteristics with a significant level of $p \leq .0.05$. This study found that most of the participants believe in the benefits of physical activity promotion towards cancer patients such as improving mental health, 80.8% (n=85). Lack of time 30.8% (n=32), patients look tired or not give cooperation 20.2% (n=21) and lack of knowledge 16.3% (n=17) are the most chosen barrier for promoting physical activity among the participants. There was no significant correlation between beliefs on benefits of physical activity promotion with age (p= 0.908), working experiences (p=0.982), type of ward (p=0.666) and the average number of cancer patient care in a week (p=0.144). This study revealed that nurses' beliefs in the benefits of physical activity promotion

towards cancer patients. However, there were barriers to promoting physical activity to cancer patients. Therefore, strengthening the provision of health information about physical activity promotion by designing appropriate strategies and adjustments for healthcare providers including nurses should be promoted.

CHAPTER 1

INTRODUCTION

1.1 Introduction

This dissertation aims to assess nurses' beliefs on benefits and barriers to physical activity (PA) promotion for cancer patients in Hospital Universiti Sains Malaysia (Hospital USM). The first chapter of the dissertation will start with the background of the study, problem statement, research questions, research objectives and hypotheses of the study. Finally, the significance of the study and the operational definition of key terms used in this study are described.

1.2 Background of the Study

Physical activity is defined as any bodily movement produced by skeletal muscles that require the expenditure of energy (WHO, 2016). All health care professionals were encouraged to promote PA to their patients due to the various benefits of PA to health and well-being. Routine PA could be able to reduce the risk of mortality and was an efficient primary and secondary preventive method for several chronic medical diseases such as cancer (Crisford, Winzenberg, Venn, & Cleland, 2013).

While cancer was a disease caused by an altered deoxyribonucleic acid (DNA) structure to the changes in genes that control the division of cells (American Cancer Society, 2014). It was estimated that 18.1 million new cases of cancer worldwide diagnosed in 2018 and approximately 9.6 million cancer deaths within one year (Bray et al., 2018). According to Globocan, there were 43837 new cancer cases, and 26395 cancer death cases had been reported in Malaysia (IARC, 2018).

Although survival rates for cancer continue to improve, cancer treatments such as surgery, hormonal therapy, radiation therapy, chemotherapy can contribute to acute, late-term, and long-term side effects (American Cancer Society, 2014a). These treatments may alter patients' body composition and physical function negatively. However, several studies agreed that PA had been shown to improve muscular strength, muscular and aerobic endurance, physical function, and many aspects of quality of life (Keogh et al., 2017). Hence, PA was able to reduce the likelihood of poor progressions of cancer and have survival benefits for a variety of groups of cancer patients (Rutledge & Demark-Wahnefried, 2016).

1.3 Problem Statement

Many adverse effects of cancer-related treatments may reduce by regular PA (Keogh et al., 2017). As a result of this evidence, published position statements outlining the importance of PA for cancer survivorship by cancer organizations, including the American Cancer Society and Exercise and Sports Science Australia (Buffart et al., 2017). However, most cancer patients still do not engage in sufficient PA to obtain health benefits, with their PA rates often being less than their age-matched and cancer-free peers (Tannenbaum, Koru-Sengul, Zhao, Miao, & Byrne, 2014).

A study mentioned that support of others such as nurses could facilitate PA in cancer patients and nurses are likely to be one of the most influential healthcare professional groups in promoting PA (Keogh et al., 2017). A cross-sectional survey support that healthcare professionals were essential to promote PA to cancer patients as it could improve the ability for cancer patients to perform daily tasks by reducing fatigue during treatment, improve mental health and quality of life (Park et al., 2015).

Some of the nurses who wish to promote PA to their patients may face challenges as promoting PA is not the primary scope of practice for them. They were more focused on nursing care such as assisting in activity daily living and performing procedures such as dressing and administering medication. However, an interdisciplinary approach in collaborations of nurses and other healthcare professional such as physiotherapist or doctors enable cancer patients to continue receiving educations about the benefits of PA to improve the quality of life and survival rate of cancer patients. Nurses were the most appropriate person to promote PA to their patients because of the frequent contact, increased length of time spent with patients and the greatest involvement in holistic care and rehabilitation of cancer patients compared to other healthcare professionals (O'Hanlon & Kennedy, 2014).

However, little is known about how nurses would promote PA to their cancer patients or the determinants such as beliefs in the benefit of PA and the barriers of PA promotion. Physical activity promotion for cancer patients among nurses was needed to provide many opportunities for improvement. This was because the approach of promoting PA was generally opportunistic, informal and unstructured, and there were substantial barriers for PA promotion. Thus, investigating nurses' beliefs on benefits and barriers to physical activity promotion for cancer patients was important as baseline knowledge for future planning on PA promotion for cancer patients to enhance patient's quality of life.

1.4 Research Questions

The research questions for this study are as below:

i. What is the physical activity promotion for cancer patients among nurses in the Hospital Universiti Sains Malaysia?

ii. What are the nurse's beliefs on the benefits of physical activity promotion for cancer patients in the Hospital Universiti Sains Malaysia?

iii. What are the nurse's barriers to physical activity promotion for cancer patients in the Hospital Universiti Sains Malaysia?

iv. Is socio-demographic characteristics (age, years of working experience, type of ward and the average number of cancer patients care in a week) correlate with the nurses' beliefs on the benefits of physical activity promotion for cancer patients in the Hospital Universiti Sains Malaysia?

1.5 Research Objectives

Research objectives describe what researchers expect to achieve at the end of a research project or study (Polit & Beck, 2010).

1.5.1 General Objective

The general objective of this study is to determine the nurses' beliefs on benefits and barriers to physical activity promotion for cancer patients in the Hospital USM.

1.5.2 Specific Objectives

The following specific objectives of this study are:

i. To determine the physical activity promotion for cancer patients among nurses in the Hospital Universiti Sains Malaysia.

ii. To determine the nurses' beliefs on the benefits of physical activity promotion for cancer patients in the Hospital Universiti Sains Malaysia.

iii. To determine the nurse's barriers to physical activity promotion for cancer patients in the Hospital Universiti Sains Malaysia.

iv. To determine the correlation between socio-demographic characteristics (age, years of working experience, type of ward and the average number of cancer patients care in a week) and the nurses' beliefs on benefits of physical activity promotion for cancer patients in the Hospital Universiti Sains Malaysia.

1.6 Research Hypothesis

Hypothesis 1 **(H_0):** There is no correlation between socio-demographic characteristics (age, years of working experience, type of ward and the average number of cancer patients care in a week) and the nurses' beliefs on the benefits of physical activity promotion for cancer patients in the Hospital Universiti Sains Malaysia.

(H_1): There is a correlation between socio-demographic characteristics (age, years of working experience, type of ward and the average number of cancer patients care in a week) and the nurses' beliefs on the benefits of physical activity promotion for cancer patients in the Hospital Universiti Sains Malaysia.

1.7 Definitions of Operational Terms

There operational terms used in this research proposal are shown below：

Physical activity promotion	Promotion is defined as the act of encouraging something to happen or develop (Cambridge Dictionary, 2018). In this study, promotion or known as the physical activity promotion practices for cancer patient among nurses will be assessed using a self-administered questionnaire adapted from Hardcastle et al., 2018; Keogh et al., 2017.
Beliefs	Belief is defined as the feeling of being sure that something exists or is true (Cambridge Dictionary, 2018). In this study, the belief also seen as the attitudes toward beneficial effects of physical activity for cancer patients. The belief among nurses will be assessed using a self-administered questionnaire adapted from Hardcastle et al., 2018; Keogh et al., 2017. The questions are focusing on the benefits of physical activity may provide for cancer patients.
Barriers	A barrier is defined as something that prevents something else from happening or makes it more difficult (Cambridge Dictionary, 2018). In this study, the barrier also recognizes as the challenges or the influence factors for decreasing the physical activity promotion for cancer patients. The barriers among nurses will be assessed using a self-administered questionnaire adapted from Hardcastle et al., 2018; Keogh et al., 2017. The questions are focusing on the factors which preventing physical activity from promoting to cancer patients.

Nurses	A nurse is a person whose job is to care for people who are ill or injured, especially in a hospital (Cambridge Dictionary, 2018). In this study, nurses are registered nurses with grade U29 and U32 that provide holistic nursing care for oncology patients in the medical and surgical wards Hospital USM.
Medical or surgical wards	A medical ward is defined as a hospital ward in which patients are being treated by drugs rather than surgery (Collins English Dictionary, 2018). A surgical ward is defined as a hospital ward where patients require surgical treatment that involves surgery (Collins English Dictionary, 2018). In this study, medical or surgical wards is referring to the wards that manage in-patients either medical or surgical management which includes cancer patients.

1.8 Significance of the Study

The findings from this study determined nurses' beliefs on benefits and barriers to physical activity promotion for cancer patients in the Hospital USM. The findings of the study could be contributed to the physical activity promotion practices in Hospital USM by nurses. Besides, it could become a reference for the healthcare professionals to plan for a more effective continuous nursing education (CNE) program and patient's health education in terms of the most suitable physical activity for cancer patients by identifying the main problem, especially in the nursing field. As nurses' responsibility increasing from time to time, health education and physical activity promotion play an essential role in the nursing field to promote tremendous health benefits for cancer patients. It may also be used as a guideline for the nurses to use it during planning for a more holistic health decision while dealing with cancer patients.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

This chapter will present a review of the literature related to PA promotion, beliefs and barriers to PA promotion for cancer patients. This chapter is organized into six sections covering topics most relevant to answering this study's research questions, meeting its objectives and supporting or disagreeing with its hypotheses. The first section focuses on physical activity and health which included the side effects of cancer treatment, patient adherence to physical activity, physical activity and quality of life, physical quality and survival and guidelines on physical activity while the following sections encompass physical activity promotion or practice for cancer patient among nurses, the beliefs on benefits of physical activity promotion and the barriers in promoting physical activity for cancer patients, the correlation between socio-demographic characteristics with the nurses' beliefs on benefits of promoting physical activity for cancer patients in Hospital USM. The final section will detail the theory of planned behaviour (TPB), the study's conceptual frameworks.

2.2 Physical Activity and Health

Physical activity is defined as any bodily movement produced by skeletal muscles that require the expenditure of energy above the resting level that was measured in kilocalories. Physical activity in daily life included occupational or working, sports or playing, conditioning, household, and other activities such as travelling (Hayes, Spence, Galvão, & Newton, 2009). A state of no signed increase in energy expenditure above resting is defined as physical inactivity (Kruk, 2009).

Regular physical activity or more significant physical activity exerted a beneficial effect on many aspects of health and reduced the risk of several chronic diseases. Physical activity adding its benefits such as reduction of the risk of all-cause death of non-communicable diseases hence reduced the rate of mortality. Numerous reports documented that regular physical activity was also useful in both the primary and secondary prevention of several diseases, such as cancer and psychological disorders (Kruk, 2009).

For adults, the most recent recommendations for health prevention emphasized moderate physical activity at least 30 minutes on five or more days a week. Alternatively, a minimum of 20 minutes of vigorous-intensity physical activity for three or more days per week. These guidelines proven with the study Eurobarometer in 2010 of 50 MET-hours per week total moderate activity accumulated over seven days or 25 MET-hours per week of vigorous-intensity accumulated over three days (Eurobarometer, 2010). In the other hand, physical activity for children and adolescent are recommended to reach at least 60 minutes of moderate-intensity activity at least five days per week, although preferably daily (American Cancer Society, 2010).

It is worth noting that although mainly the health gain is obtained through the above-mentioned dose of activity, the amount may not be sufficient to protect against certain cancers (Kruk, 2009). The guidelines on physical activity for cancer patients will be discussed in Chapter 2.2.5. Therefore, physical activity held an essential role in maintaining and improving the health of a person.

2.2.1 The Side Effects of Cancer and It's Treatment on Health

Cancer is an aggressive disease that was difficult to treat due to a variety of reasons, including the significant inter and intratumor heterogeneity and the mutations in hundreds of different genes contributing to cancer. Cancer could affect a wide range of cells and organs in the body. Besides, cancer was generally not a static disease, but evolves and progresses over time accumulating new mutations. Therefore, with cancer increasing incidence, related clinical management continues to be a challenge in the 21st century. Traditional cancer treatment considered a category comprise of radiation therapy, surgery, chemotherapy and proton therapy (Bidram et al., 2019).

However, there were some proven side effects of these treatments that can affect health. Chemotherapy accidentally damages normal tissue surrounding the tumour. Chemotherapeutic agents target cells with a high basal level of proliferation and regeneration, including tumour cells and non-tumour rapidly proliferating cells. This caused a high level of toxicity associated with such treatments (Bidram et al., 2019). A cross-sectional study reported that individual for all six chemotherapy cycles considered as a single time unit. The side effects most frequently reported was hair loss, nausea, and tiredness. Each of these side effects was experienced by more than 80% of patients at some time up through cycle 6; some of the patients experienced the side effects in any single process. Besides, vomiting, sleep disturbance, weight gain, mouth sores, and numbness or tingling were each a consequence for more than 40% of the sample. For each side effect, the incidence level within any single cycle was much less than the level characterizing the entire six cycles of treatment. In other words, the percentage of patients reporting an inevitable side effect of chemotherapy remained relatively constant across cycles (Orsak, Stevens, Brufsky, Kajumba, & Dougall, 2015).

Nausea and vomiting were selected as two side effects they were most worried about by cancer patients. The prevalence of vomiting was slightly lower than that of nausea, but it remained the most problematic symptom. More than half and approximately half of the chemotherapy patients experienced hair loss and loss of appetite, respectively. It was also important to note that numbness, confusion, loss of concentration and a reduced sense of touch resulting from chemotherapy-induced peripheral neuropathies (CIPN) were experienced by nearly half of patients and believed to be the major symptoms being overlooked by healthcare professionals (Chan & Ismail, 2014).

Radiation therapy caused side effects which remains an important component of cancer treatment for at least 50% of all cancer patients, two treatment side effects, anticipatory nausea and weight gain. Anticipatory nausea rose from 1 1% to 34% while weight gain increased from 8% to 24% (Orsak et al., 2015). Other side effects worthy of discussion were sadness and depression. It was experienced by more than 40% of patients. The relationship between psychological morbidities and cancer has been well-established (López-Camarillo & Marchat, 2013).

Furthermore, a variety of long-term complications such as cardiotoxicity, neurotoxicity, infertility, nephropathy, and chronic liver damage often follow conventional cancer therapies. On the other hand, several novel strategies had emerged, showing great potential in cancer therapy, reducing suffering and cancer-related death. These include photodynamic therapy, photothermal therapy, gene therapy and nano particle-drug therapy (Bidram et al., 2019). Also, physical activity reduced the side effects of cancer treatment and at the same time, increase the patient's survival and quality of life (Keogh et al., 2017).

2.2.2 Patient Adherence to Physical Activity

Several randomized controlled trials have evaluated physical activity programme offered to cancer adult's patients. The programme varied considerably in duration, ranging from 2 weeks to 1 year, although most programmes lasted between 3 and 6 months. The studies offered supervised exercise training and home-based training. Many programmes recommended that participants engage in moderate-intensity physical activity that increased progressively to at least five days a week for at least 30 minutes per day. Most programmes focused on aerobic exercise; trials offered resistance training or a combination of both. The intensity of the aerobic training showed considerable variability with study participants required to exercise from at least 40% to no more than 85% of the estimated maximum heart rate (Szymlek-Gay, Richards, & Egan, 2011a).

Although the uptake of the exercise programme was varied with only 63% of the approached patients agreeing to undertake the exercise intervention, adherence rates to the exercise programme were good. The required level of intensity of aerobic training did not appear to affect adherence rates. In general, the programme was effective in that the study participants increased their physical activity levels from 1.5 to 4.9 MET-hours per week at baseline to 6.2 to 16.8 MET-hours per week at the end of an exercise programme (Szymlek-Gay, Richards, & Egan, 2011b).

Lower body mass index, a higher degree of readiness to change physical activity behaviour, better self-efficacy scores at baseline, higher physical activity levels before commencing an exercise programme, higher aerobic fitness, more advanced disease stage, lower depression, younger age, and more positive attitude towards exercise have been identified as predictors of better adherence to physical activity programme (Szymlek-Gay et al., 2011a).

2.2.3 Physical Activity and Quality of Life

Physical inactivity was a modifiable risk factor for cardiovascular disease and a widening variety of other chronic diseases, including diabetes mellitus, obesity, hypertension, bone diseases, depression and finally, cancer. Conversely, physical activity of moderate intensity at least 30 minutes every day was often enough to protect against many diseases, improve mental health and well-being in women, the elderly and cancer patient. Physical activity was also useful in treating several conditions which reduce the chances to develop cancer (Kruk, 2009).

Several reviews have been published on the relationship between cancer and routine physical activity, and it appears that regular physical activity as part of a job or as a leisure activity, was associated with reductions in the incidence of specific cancers, particularly colon and breast cancer. A systematic review of epidemiologic studies revealed that moderate physical activity was associated with a greater protective effect than activities of less intensity. Physically active men and women exhibited a 30% to 40% reduction in the relative risk of colon cancer, and physically active women a 20% to 30% reduction in the relative risk of breast cancer compared with their inactive counterparts (Warburton, Nicol, & Bredin, 2006b).

Improving physical activity during cancer treatment typically could influence cancer treatment effectiveness and cope by managing side effects, maintaining physical fitness, and preventing muscle loss and weight gain, fatigue and deterioration in the quality of life. Continuous physical activity post-cancer treatment typically aimed to speed recovery, improve physical fitness. In terms of enhancing the quality of life, physical activity able to reduce fatigue, distress and decrease the risk of developing chronic diseases or secondary cancers. In summary, physical activity demonstrates

significant benefits both during and post-cancer treatment to influence the quality of life positively (Buffart et al., 2017).

2.2.4 Physical Activity and Survival

Although cancer remained the leading cause of death in New Zealand, accounting for a third of all deaths, survival rates had improved over the last two decades. The overall cumulative relative five years survival rate across all cancers and all disease stages was currently estimated at 61%. However, the chances of survival were more significant if diagnosed with early-stage disease and changing in term of common lifestyle factors. The number of survivors to 5 years in New Zealand was estimated to be approximately 60,000, which represents 1.5% of the New Zealand population. Continued advances in treatment and lifestyle factors are likely to increase further the number of cancer survivors (Szymlek-Gay et al., 2011a).

Other investigations had revealed even more significant reductions in the risk of death for cancer patient from any cause and cardiovascular disease by being fit or active. This was associated with a greater than 50% reduction in risk for cancer. Furthermore, an increase in energy expenditure from the physical activity of 1000 kcal per week or an increase in physical fitness of 1 MET (metabolic equivalent) was associated with a mortality benefit of about 20%. Physically inactive middle-aged women experienced a 52% increase in all-cause mortality, a doubling of cardiovascular-related mortality and a 29% increase in cancer-related mortality compared with physically active women (Kruk, 2009).

A review of the literature revealed that moderate physical activity (> 4.5 MET-hours) for about 30 to 60 minutes per day had a more significant protective effect against colon and breast cancer than activities of low intensity. The greatest benefit for reducing the incidence of breast cancer was observed among women who engaged in 7 or more hours of moderate-to-vigorous activity per week. Among patients with established cancer, physical activity equivalent to walking one or more hours per week was associated with improved survival compared with no exercise. The most significant benefit was observed among cancer survivors who performed exercise equivalent to 3 to 5 hours per week at an average pace (Warburton, Nicol, & Bredin, 2006a).

Evidence-based on prospective observational studies suggested that regular physical activity was associated with improved cancer prognosis, although data are few and only limited to breast and colon cancer survivors. Specifically, breast cancer survivors who engaged in physical activity at least 8 to 10 metabolic equivalent (MET)-hours for a week compared with less active survivors had a 40% to 50% reduced risk of death from breast cancer, and a 24% to 67% decreased risk of overall mortality, and a 26% to 43% reduced the risk of recurrence of breast cancer. Similarly, physically active colon cancer survivors who engaged in physical activity at least 9 MET-hours in a week appeared to had a 43% to 61% lower risk of colon cancer mortality compared with less active survivors, and a 29% to 63% lower risk of overall mortality (Szymlek-Gay et al., 2011a). Therefore, physical activity improved cancer prognosis by reducing the amount of adipose tissue, improve insulin resistance and enhance immune function. Physical activity had been shown to directly reduce systemic inflammation, protect against the development of primary cancers without changes in body composition. Therefore, improved survival of cancer patients.

2.2.5 Guidelines on Physical Activity for Cancer Patient

It is stated apparently that physical activity could prevent cancer or increase the prognosis of cancer. However, doubt remains over the optimal frequency, duration, and intensity of physical activity. The minimum requirement for health benefits on health status effects by the physical activity intensity. There was evidence that the intensity of physical activity is inversely and linearly associated with mortality.

Early work by Warburton revealed that regular physical activity which expending about 8400 kJ per week was associated with an average increase in life expectancy of 1 to 2 years by the age of 80 and that the benefits were linear even at lower levels of energy expenditure. Currently, most health and fitness organizations and professionals advocate a minimum volume of exercise that expended about 4200 kJ per week and acknowledge the added benefits of higher energy expenditures (Warburton et al., 2006a).

The American Cancer Society updated the physical activity guidelines every five years. Recently the World Cancer Research Fund *(*WCRF*)* and the American Institute for Cancer Research *(*AICR*)* guidelines for cancer prevention recommended engaging in at least 30 minutes of moderate physical activity every day. Improvement of fitness needs 60 minutes or more of moderate activity or 30 minutes or more of vigorous physical activity every day for a cancer patient (Rock et al., 2012). Table 2.1 shows the differences between light, moderate and vigorous-intensity physical activities.

Table 2.1 Differences of Light, Moderate and Vigorous Intensity Physical Activities (Rock et al., 2012)

	Light Intensity (<3.0 METs) Easy to talk and carry on a conversation	**Moderate Intensity (3.0-6.0 METs)** Able to talk and hold short conversations	**Vigorous Intensity (>6.0 METs)** Difficult to talk more than a sentence)
Exercise and Leisure	Walking slowly, Fishing	Brisk walking, dancing, leisurely bicycling, ice and roller skating, horseback riding, canoeing, yoga	Jogging or running, fast bicycling, circuit weight training, aerobic dance, martial arts, jumping rope, swimming
Sports	-	Volleyball, golfing, softball, baseball, badminton, doubles tennis, downhill skiing	Soccer, field or ice hockey, singles tennis, racquetball, basketball, cross country skiing
Home activities	Light household chores (cooking and washing dishes)	Mowing the lawn, general yard and garden maintenance	Digging, carrying and hauling, masonry, carpentry
Workplace activity	Sitting at a desk	Walking and lifting as part of the job (custodial work, farming, auto or machine repair)	Heavy manual labour (forestry, construction, firefighting)
METs= Metabolic Equivalent 1 MET = the energy requires to sit quietly			

The American College of Sports Medicine and the American Cancer Society had recommended regular exercise to cancer survivors. These guidelines proposed that cancer survivors should perform either 75 minutes of vigorous-intensity or 150 minutes of moderate-intensity aerobic exercise per week, or some combination of the two (Table 2.2). The guidelines also advised that the whole exercise should be spread across at least three days or a week. Moreover, cancer survivors should also perform resistance exercise for all major muscle groups for at least two days or a week. If these guidelines are not achievable, cancer survivors should do their best to avoid inactivity by engaging in at least some light activities of daily living (Courneya, Crawford, & Adams, 2015).

Table 2.2 Summary of Exercise Recommendations for Cancer Survivors (Courneya et al., 2015)

Physical Activity Type	Target Dose	
Aerobic Exercise	**Option 1** • Frequency (3–7 days per week) • Intensity (Moderate Time, ≥ 150 minutes per week, Bouts of ≥ 10 minutes) • Type (Any such as walking, cycling, tennis)	**Option 2** • Frequency（3–7 days per week) • Intensity (Vigorous Time, ≥ 75 minutes per week, Bouts of ≥ 10 minutes) • Type Any (such as jogging, soccer, snowshoeing)
Resistance Exercise	• Frequency (≥ 2 days per week • Intensity, Moderate to vigorous (60%–80%), 1–2 minutes of rest between sets • Volume (1–3 sets of 8–12 repetitions Exercises and all major muscle groups (chest, back, shoulders, arms, abdomen, hips, legs)	
Flexibility Exercise	Stretch all major muscle groups on days that other exercises are performed	
Avoid Inactivity	All patients and survivors are encouraged to be as physically active as their conditions will permit.	

A survey study by Irwin (Irwin, 2008) on the physical activity programming preferences for the cancer patient mentioned that some cancer survivors preferred to perform physical activity alone. Some cancer survivors also noted a preference to begin a physical activity immediately after diagnosis, while little preferred to wait until after completing cancer treatment. A majority chose to participate in recreational activities such as brisk walking. In summary, the decision regarding when to initiate and how to maintain physical activity should be individualized to the patient's condition and personal preferences. It this important that cancer patients have unique and varied physical activity counselling and programming preferences so that they can maintain the physical activity sufficiently (Irwin, 2009).

2.3 Physical Activity Promotion for Cancer Patients

As physical inactivity is a societal problem, raising the level of activity needed a greater awareness in society and relevant knowledge about multiple benefits of regular exercise. Among priority areas of action, particularly important of promoting physical activity among children and adolescent, older adults by creation individually adapted health behaviour change to make an activity a daily part of people's life. It was also recommended for patients, especially cancer patients, to consult with professionals regarding the amount and level of their physical activity being safe and appropriate for them (Kruk, 2009).

The American Cancer Society recommended that cancer survivors participate in 150 minutes of moderate-intensity physical activity per week. However, less than 30% are meeting these recommendations. The healthcare professionals were instrumental in facilitating health behaviour change in cancer survivors, and the transition from cancer patient to cancer survivor has been described as a "teachable moment", whereby patients may be more motivated to make health behaviour changes such as increasing physical activity to achieve the "teachable moment" (Hardcastle et al., 2018).

Nurses should promote the physical activity guidelines, refer patients to exercise specialists and recognize their role as an essential source of motivation for cancer patients to participate in regular physical activity. Nurses often recognized the role of promoting physical activity to cancer patients as nurses are the person that spent more time with patients and hence increased the frequency of the opportunities to interact with patients. The previous study showed that 43% of oncologists tried to promote physical activity to their cancer patients and 64% enquire about their patients' physical activity during some to most visits. Regardless of these results, patients with cancer were most likely to benefit

when the healthcare professional promoted physical activity as an interdisciplinary team (Keogh et al., 2017).

2.4 Beliefs in Promoting Physical Activity for Cancer Patients

Healthcare professional believed that physical activity had many benefits for their cancer patient. Based on the previous study, nurses mostly agreed that physical activity improved patients' health-related quality of life and survival. The physical activity promotion practices of these nurses were based mainly on their beliefs of the benefits of physical activity for cancer survivorship (Keogh et al., 2017).

Overall, healthcare professional believed that they were confident in recommending physical activities to their cancer patients and displayed strong intentions to promote physical activity in practice. The majority of healthcare professionals (≥86%) believed and agreed that physical activity was possible during cancer treatment, could improve quality of life, was associated with reduced fatigue, could play an essential role in the management of long-term treatment-related side effects and enhanced behavioural changes such as adopting a healthier diet linked with minimizing lifestyle risk factors for patients with breast, colorectal and prostate cancer (Cantwell et al., 2018).

2.5 Barriers in Promoting Physical Activity for Cancer Patients

The previous study showed that nine out of every ten respondents (88%) either agreed or strongly agreed that discussing physical activity with cancer patients was part of their role (Spellman, Craike, & Livingston, 2014). The three barriers reported by healthcare professionals when promoting physical activity to cancer survivors included limited time with patients, lack of community-based exercise rehabilitation programme

to refer to and lack of resources such as education leaflets and materials regarding physical activity for cancer survivors (Cantwell et al., 2018).

Nurses were generally increased in workload as they are not only performing nursing care towards their patients but also committed to hospital documentations and other managements matter. Other than that, the ratio of nurse to patients are sometimes 1 to 12. Hence, nurses may forget or lose intention in promoting physical activity to their cancer patient. Although nurses were the person who directly interacts with patients, limited time still became the barriers to promote physical activity as nurses spent more time writing a report or doing a procedure, physical activity promotion became an option for them.

Another study showed that the barriers to physical activity promotion by the oncology nurses were lack of time, lack of adequate support structures, and risk to the patient. Of note, 116 oncology nurses reported no barriers in promoting physical activity to their patients. Oncology nurses working in metropolitan hospitals were significantly more likely to cite a lack of knowledge as a barrier to physical activity promotion than those working in rural and regional hospitals. Experienced nurses were more likely to state that they had no obstacles in promoting physical activity than those with less than 25 years of practice. The experienced nurses were less likely to cite a lack of expertise and knowledge as barriers to physical activity promotion than their less experienced counterparts (Keogh et al., 2017).

As lack of knowledge became one of the barriers in promoting physical activity as there were nurses who did not expertise the physical activity part because they felt that physical activity was not the field of their study. Hence, promotion of physical activity became less confident and less practice; patients eventually had limited access to physical

activity. Patients would feel a lack of interest over time because of lacking training or guidance on physical activity prescription by any healthcare professional.

2.6 Demographic Characteristics and Physical Activity Promotion for Cancer Patients

Socio-demographic able to effect physical activity promotion. Profession and working experiences among healthcare workers able to influence the promoting of physical activity. Research had proven that nurses gained knowledge through working experiences to provide the most holistic care to their patients. On the other hand, technical skills and communicative capabilities also developed as the working experiences increased (Kieft, De Brouwer, Francke, & Delnoij, 2014).

As the working experiences increased, knowledge related to the nursing profession would be maintained and followed both existing development and new insights. A cross-sectional study proved that knowledge was not the barriers to promote physical activity to their cancer patient for nurses who work for more than 25 years. Thus, the intentions of promoting physical activity are generally based on the beliefs on the benefits of physical activity promotion for cancer patients (Keogh et al., 2017).

Nurses who had more working experiences believed that promoting physical activity to cancer patient would not affect the effectiveness and safety of care. When nurses had communicative capabilities, nurses served as spokespersons for patients who are often in vulnerable positions. Nurses were easily accessible and could act as a link between the patient and other professions. Nurses could use the right substantive arguments on behalf of a patient's interests or needs such as promoting physical activity to the cancer patient and hence improved the quality of care (Kieft et al., 2014).

However, a study mentioned that there was no significant difference between the beliefs on the benefits of physical activity with nurses working experience as nurses are having similar idea and perspectives about the benefits of physical activity. It was because nurses had the same objectives for their patient which maintained the well-being of the patient and hence generated the intentions of promoting physical activity to cancer patients automatically (Keogh et al., 2017).

Another research was done in the podiatry setting where podiatrist's patient loaded includes a high percentage of patients with chronic disease and high-risk groups with diabetes which required medical or surgical treatment of lower extremities. This provided an opportunity for podiatrists for health promotion and the study showed that 83% of respondents agreed that it is their responsibility to give general physical activity advice to their patients. Attitudes towards physical activity promotion were mostly positive with 57% agreeing that patients were appreciated physical activity promotion, 74% agreed they would feel satisfied promoting physical activity, and 69% felt promoting physical activity would help patients to be more physically active (Crisford, Aitken, Winzenberg, Venn, & Cleland, 2020).

Most podiatrists also thought that for them, physical activity promotion was beneficial (90%), useful (92%), pleasant (80%) and enjoyable (79%). Eighty-three per cent of respondents agreed that they have the confidence to give general physical activity advice, and 84% to discuss physical activity options with their patients. Sixty-two percent believed they know, and 67% believed they have the skills to promote physical activity (Crisford et al., 2013).

2.7 Theoretical and Conceptual Framework of the Study

To describe the ideas related to physical activity promotion, the Theory of Planned Behavior (TPB) offers a useful theoretical lens with which physical activity promotion researchers may explain and predict this behaviour. Using the TPB is an important goal for researchers and practitioners so that creating a successful increase in physical activity promotion and beliefs on the benefits of physical activity for cancer patients.

The Theory of Planned Behavior (TPB) was an extension of the theory of reasoned action made necessary by the original model limitations in dealing with behaviours over which people had incomplete volitional control. TPB described how the attitude toward the behaviour or normative beliefs, perceived control, and intentions may influence behaviour (Ajzen, 2012). It was important to note that of among the various health behaviour theories, the TPB was particularly well suited to framing interventions because it helped to describe those intentions influence the behaviours, in this study, the intentions influence physical activity promotion. Three main concepts serve as the foundation for the TPB: attitude toward the behaviour perceived control, and intentions (Ajzen, 2012). The theory was applicable because it emphasized the perceived beliefs that individuals assume were held by other people. This was known as the subjective norm and allowed consideration of social demands that may influence behaviour.

First, the attitude toward the behaviour or normative beliefs must be assessed their confidence in their ability to perform it. Self-efficacy beliefs could influence the choice of activities, preparation for an activity, effort expended during the performance, as well as thought patterns and emotional reactions (Ajzen, 2012).

Second, perceived behavioural control was considered. It was the extent to which people believed that they could perform a given behaviour if they were inclined to do so. The importance of actual behavioural control was self-evident: The resources and