Oncology Nurses' Attitudes, Beliefs and Perceived Barriers Towards Nutritional Management and Promotion of Physical Activity in Oncology Patients

A dissertation presented to the Faculty of Health Sciences in part-fulfilment of the requirements for the Degree of Master of Science in Nursing at the University of Malta

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Dedication

I dedicate this thesis to my late grandmother, Josephine Bondin, who not only inspired me to follow in her footsteps and pursue a career in Nursing, but whose own five and a half year journey with pancreatic cancer sparked my interest in gaining knowledge on how nutrition and physical activity may aid her and others with similar diagnosis in alleviating the symptoms associated with the disease.

I know how proud you were of my achievements, and I only hope that I managed to continue to instil in you that same sense of pride through the completion of this thesis.

Your kind words and loving character will never be forgotten.

Acknowledgements

Firstly, I would like to give my most heart-felt thanks to my dissertation supervisor, Dr. Danika Marmara', for her invaluable advice and support throughout the process of conduction of this dissertation.

Moreover, I would like to express my gratitude to all the oncology nurses working at Sir Anthony Mamo Oncology Centre for their willingness to participate in my study, as well as for all their hard work and dedication that they put in on a daily basis to ensure that the highest standard of care is delivered to their patients.

I would also like to thank my parents, Audrey Vella Bondin and Ray Vella, who have always encouraged me to strive to reach my highest potential in my academic career. I remain eternally grateful to you both.

Finally, I must also thank my boyfriend, Kalean Agius, who has been my pillar of strength throughout all these years. Thank you for your constant support and understanding, particularly throughout the toughest year of my life.

Abstract

Background: No previously conducted studies have investigated factors related to oncology nurses' attitudes, beliefs and perceived barriers towards nutritional management and the promotion of physical activity in oncology patients. This thesis aimed to explore the local oncology nurses' attitudes, beliefs and perceived barriers towards conducting these behaviours to determine which socio-demographic variables affect the nurses' conduction of the target behaviour in order to increase their willingness to learn regarding nutritional management and promotion of physical activity.

Methods: A quantitative, cross-sectional design was utilised. All 91 oncology nurses working at Sir Anthony Mamo Oncology Centre at the time of conduction of this study were invited to participate, 11 of which were asked to participate in a pilot study. The research tool consisted of an online survey formulated by the researcher herself based upon the Theory of Planned Behaviour, the link to which was sent via email by an intermediary.

Findings: Nurses encompass a positive attitude towards nutritional management, are mostly well informed regarding nutritional care, but require enhancements in their confidence to perform this behaviour. They possess a positive attitude towards physical activity promotion and are quite knowledgeable on the effect of physical activity on oncology patients. Nonetheless, they lack the confidence that they require to promote physical activity effectively. The nurses identified a lack of training in their undergraduate program and a lack of guidelines and protocols in their workplace pertaining to both target behaviours as the main barriers to the conduction of physical activity.

Conclusion: Staff nurses who are older than 51 years of age, or those with either fewer years of experience in the oncology setting, as well as those who are only in contact with patients while the latter are receiving their treatment should be prioritised for undergoing educational intervention through online lectures.

Keywords: oncology nurse, nurtition, physical activity, attitude, belief, barrier, oncology patient

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Introduction

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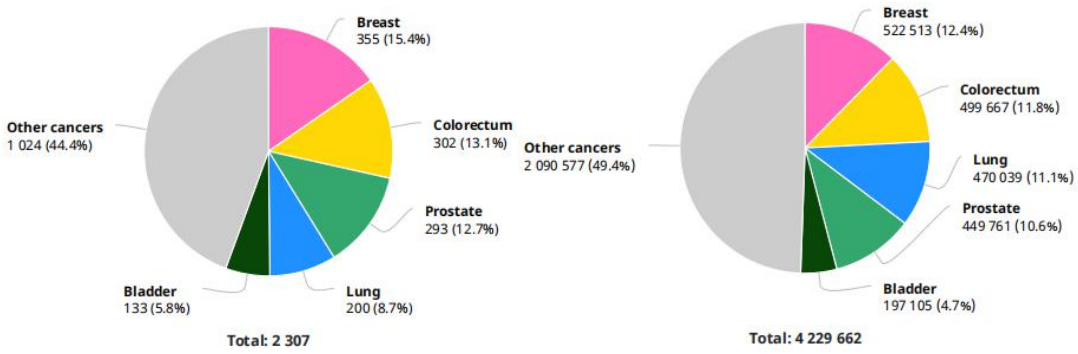
1.1 Introduction

This introductory chapter provides background information regarding oncology nurses' attitudes, beliefs and perceived barriers towards the nutritional management and promotion of physical activity (PA) to oncology patients. Furthermore, the purpose of this study, and its relevance and significance to research is ascertained. A brief overview of the methodological approach to be adopted in this study is provided.

1.2 Background

A constant rise in the incidence of the number of people who are diagnosed with various cancers is evident both locally and worldwide. According to the National Cancer Plan 2017-2021, 1800 new cases of cancer are diagnosed annually. The Global Cancer Observatory (2020) established that the most common cancers in men include those related to the prostate, colorectum, lung, bladder and kidney, while the most common cancers in women include those related to the breast, colorectum, corpus lutei, lung and Non-Hodgkin lymphoma. These findings are mostly consistent with statistics related to the incidence of newly diagnosed individuals and prevalent individuals in Europe, and are illustrated in Figure 1.



Total number of new cases in Malta Total number of new cases in Europe

Figure 1. Bar charts demonstrating the total incidence of new cases in Malta and Europe in 2018

Furthermore, the incidence of newly diagnosed individuals is expected to increase by 1.5-2% on a yearly basis (National Cancer Plan, 2017). This increment is expected to occur for the next 20 years, both locally and internationally (Coleman et al., 2008). Figures 2 and 3 give a numerical interpretation of the predicted increment of incident cases until the year 2040 for both the local and international population respectively.

		2018	2040 ▾			
		Number	Number	Demographic change	Change in risk	Overall change
Malta	Males (APC 0%)	1 236	1 756	520 (+42.1%)	0	520 (+42.1%)
Malta	Females (APC 0%)	1 071	1 312	241 (+22.5%)	0	241 (+22.5%)
Malta	Both sexes	2 307	3 068	761 (+33.0%)	0	761 (+33.0%)

Figure 2. The predicted total number and percentage increase in incident cases in Malta by 2040

		2018	2040 ▾			
		Number	Number	Demographic change	Change in risk	Overall change
World	Males (APC 0%)	9 456 418	16 014 743	6 558 325 (+69.4%)	0	6 558 325 (+69.4%)
World	Females (APC 0%)	8 622 539	13 518 251	4 895 712 (+56.8%)	0	4 895 712 (+56.8%)
World	Both sexes	18 078 957	29 532 994	11 454 037 (+63.4%)	0	11 454 037 (+63.4%)

Figure 3. The predicted total number and percentage increase in incident cases worldwide by 2040

The presence of risk factors including an ageing population, enhancements in the number and availability for screening of various cancers, the lack of performance of adequate levels of physical activity, lack of engagement in healthy eating habits, and smoking, further aided to increase the incidence of various cancers (You & Henneberg, 2018). According to Ahmad et al. (2015), incidence trends demonstrated that the lifetime risk of being diagnosed with cancer for people in the United Kingdom who were born in 1960 is predicted to surpass 50%. It is thus predicted that, currently, the lifetime risk of people who are 60 years old to be diagnosed with cancer is 35% for females and 40% for males (National Cancer Plan, 2017).

Notwithstanding this, the rate of cancer survivorship is also increasing, with an age-standardised ten year survival of 50% in Malta (National Cancer Plan, 2017). This improvement is the result of enhancements in the understanding of the most effective treatments to be administered, as well as due to the constant upgrading of the national health system to improve the quality and the number of services provided to oncology patients (National Care Plan, 2017).

Brown et al. (2012) highlight the importance of PA not only as a preventative measure towards cancer, but also due to its perceived benefits after diagnosis, during treatment and survivorship. Moreover, Courneya and Friedenreich (2001) established a conceptual model called Physical Exercise Across the Cancer Experience (PEACE) (Figure 4) to illustrate the influence of PA on patients at numerous stages during the cancer continuum. The cancer experience has been divided into two pre-diagnosis time periods, that is, pre-screening, and screening/diagnosis, and four post-diagnosis time periods. The latter include pre-treatment, treatment, post-treatment and resumption. However, people may experience these time periods more than once, such as due to the need for numerous screenings and treatment or due to disease

recurrence (Courneya & Friedenreich, 2001). Furthermore, eight cancer outcomes were identified within these time periods whereby a PA intervention may have a significant effect on the individual's health related quality of life (HRQOL), cancer-related consequences and physical fitness outcomes. This demonstrates the significance of oncology nurses' role in the promotion of PA due to their close contact with patients throughout their cancer trajectory (Karvinen et al., 2012).

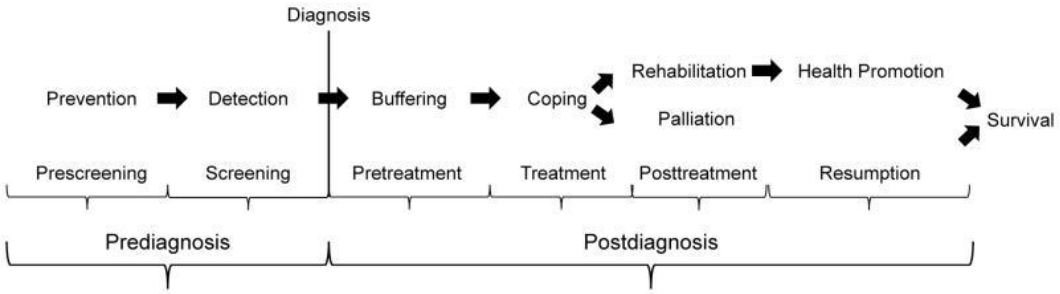


Figure 4. Conceptual model of the multiple aspects that physical activity may influence throughout the cancer trajectory as established by Courneya and Friedenreich (2001)

The first cancer outcome of PA includes the reduction in the likelihood of cancer development. PA aids in the detection of cancers during the screening/diagnosis timeframe due to its effect on the sensitivity and specificity of most screening tests, such as the prostate specific antigen and faecal occult blood. Buffering, the third cancer outcome, refers to the ability of PA to strengthen the cancer patient's physical and mental condition prior to receiving their treatment in the pre-treatment phase. Moreover, the coping outcome states that PA has an effect on the patient's ability to manage the physical and psychological affects of their disease and the side effects of the treatment which they would be receiving. PA further aids in the rehabilitation outcome once the treatment has been advantageous towards eradicating the disease by facilitating the patient's recovery from physical effects that they may have

experienced due to their disease. This would then lead to the health promotion cancer outcome whereby one would have fully recuperated from the effects of their treatment and therefore, the focus is shifted towards enhancing the patient's overall health (Courneya & Friedenreich, 2001). However, if the treatment has been deemed futile or has become contraindicated given that particular patient's overall condition, the cancer outcome of palliation comes into effect. The priorities include alleviating the patient of discomfort and managing the symptoms of those patients who may not be cured. Lastly, PA is given importance for survivorship, the final cancer outcome, as it has been shown to improve the rate of survival due to a decrease in mortality and an increase in the disease-free time period prior to recurrence (Courneya & Friedenreich, 2001).

As stated earlier, patients who undergo treatment may suffer from short or long-term side effects, which in turn, negatively impact their HRQoL (Mazzotti et al., 2012). A common side effect includes cancer-related fatigue, which may result in oncology patients not being able to exert themselves. This may result in them refraining from carrying out any PA. However, this is an undesirable consequence, as multiple studies have demonstrated that maintaining activity levels throughout the cancer trajectory leads to the upkeep, or even to the enhancement of their physical and affective well-being (O'Hanlon & Kennedy, 2014). Furthermore, patients who engage in PA may experience a decrease in this cancer-related fatigue (Schmitz et al., 2019). In addition, studies have also established that the implementation of PA, both in those who are undergoing treatment (Mishra et al., 2012) as well as those who are in survivorship (Mishra et al., 2012), report possessing a greater HRQoL than those who do not partake in any PA. Lastly, through their studies, Irwin and Mayne (2008) and Davies et al. (2011) illustrate that oncology patients who would have been

previously diagnosed with breast, colorectal or prostate cancer may lessen their potential of experiencing a recurrence of their disease if they undergo regular PA, leading to an enhancement in the rates of survivorship in these patients.

Patients who undergo hormone related treatments may experience unwarranted adjustments in their body compositions, such as sarcopenic obesity. The latter refers to a decrease in muscle and bone mass with the consequence of experiencing an increase in fat mass (Bylow et al., 2007). In turn, this may negatively affect the patient's ability to perform activities of daily living independently, and may also increase the patient's risk for fractures (Sonmez et al., 2014). This fact might trigger fear in the patient, which in turn, will further hinder them from performing PA. Therefore, this sequence of events may potentially lead to an additional decline in the patient's functional abilities. This highlights the currently unmet need of providing tailor made advice on the most effective and safest method of PA that particular patient should be undergoing (Schmitz et al., 2019).

Makhija and Baker (2008) report that as many as 80% of oncology patients may present with malnutrition. The latter may hinder the effectiveness of the patient's treatment, as well as reduce their rate of survivorship. This suggests that the early recognition of patients who are at risk of becoming malnourished is of epitome importance due to the possibility of complications which arise as a result of this malnutrition, which will therefore have a negative impact on their HRQoL (Makhija & Baker, 2008).

Moreover, malnutrition may be prevalent in patients who are receiving chemotherapy, due to the possibility of them experiencing chemotherapy-induced nausea and vomiting. Davidson et al. (2012) established that 40% of patients who undergo chemotherapy experience at least one episode of nausea and vomiting, and

84% of these patients report that this symptom is not managed effectively. As a result, these patients' capability of receiving a balanced diet is compromised, potentially resulting in anorexia. This may then jeopardise the patients' tolerance to their prescribed treatment, thereby increasing morbidity and mortality, and reducing their HRQoL (Davidson et al., 2012). Chemotherapy may also cause mucositis, an unwarranted side effect which may cause the patient to experience pain, oral impairment and bleeding (Sonis et al., 2004). Therefore, the risk of malnutrition is imminent due to the patient's decrease in food intake as a result of this pain (Brown & Wingard, 2004). Furthermore, patients who have been diagnosed with head and neck cancers present a high risk of malnutrition, both due to the effect that the localised tumour brings about, due to hindrance to mastication and deglutition, as well as due to the effects of the administered treatment (Talwar et al., 2016). The aforementioned factors highlight the essential implications that nurses should be competent in assessing and implementing the appropriate management in patients who are at a high risk of developing malnutrition and its associated complications.

1.3 Rationale and significance of the study

The research question includes: what are the oncology nurses' attitudes, beliefs and perceived barriers to the nutritional management and conduction of physical activity in oncology patients? Through the conduction of a literature search, which occurred prior to the formulation of the research question, it was noted that the chosen topic is currently very understudied. There are also currently no local studies regarding the research topic, suggesting that the local circumstances regarding oncology nurses' attitudes, beliefs and perceived barriers towards nutritional

management and promotion of PA are unknown. Therefore, this study shall provide insight into the local oncology nurses' attitudes, beliefs, knowledge and perceived barriers towards their provision of nutritional management and promotion of physical activity to their oncology patients.

1.4 Purpose of the study

The purpose of the study was to determine oncology nurses' attitudes, beliefs and perceived barriers towards nutritional assessment and management and the promotion of PA in oncology patients. Through this research, any inconsistencies between what oncology nurses claim to know and what they do actually practice with their patients was ascertained. Moreover, the study also aimed to scrutinise whether the knowledge that they perceive themselves to encompass, had an effect on the conduction of the target behaviour and on their confidence in being competent in actually conducting the behaviour. Furthermore, it aimed to establish whether these nurses perceive any barriers to be present that may be hindering them from conducting the appropriate nutritional management and promotion of PA to their patients. Lastly, the most effective intervention to ensure eagerness and commitment of the oncology nurses towards enhancing their knowledge to reduce any unmet patient needs was explored.

1.5 The research design

The study adopted a quantitative cross-sectional research design. Information regarding the oncology nurses' demographics, as well as their attitudes, beliefs and

perceived barriers towards nutritional management and promotion of PA was obtained through the use of a survey. The study population included the nurses working in the Sir Anthony Mamo Oncology Centre (SAMOC) during the time of study were selected as the study population. The survey was created by the author for the purpose of this dissertation.

1.6 Conclusion

This chapter highlights the significance of the assessment and management of oncology patients' nutritional status, as well as the magnitude of the conduction of physical activity for these patients. This is due to the oncology nurses' ability to bring about the necessary lifestyle changes to these patients as a result of their close contact at multiple points throughout the patients' cancer pathway. The rationale, significance and purpose of the study were outlined. The following chapter provides a review of the current literature pertaining to the research topic.

Chapter 2: The Literature Review

Chapter 2: The Literature Review

2.1 Introduction

This chapter aims to provide an overview of the current evidence regarding oncology nurses' attitudes, beliefs and perceived barriers towards nutritional management and promotion of physical activity (PA) in relation to the aims of this research study. A comprehensive description of the theoretical framework that shall be applied to the research study is provided. This is followed by an account of the process that was undergone to retrieve and select eligible studies, as well as the critical appraisal conducted. A synthesis of the main findings of each study is also provided.

2.2 Theoretical Framework

The research question suggests that the oncology nurses' intentions regarding the nutritional management and promotion of PA to oncology patients must be comprehended in order to accurately predict their behaviour, and employ any necessary modifications to depict the target behaviour. Since intentions are considered as weak predictors of behaviour, Ajzen and Fishbein (1980) established that intentions may anticipate behaviours precisely only when the individual is able to willingly perform the behaviour. Therefore, through this perceived ability to control their behaviour, the intention and the actual behavioural performance is affected (Terry & O'Leary, 1995). Furthermore, Dzewaltowski et al. (1990) stated

that the measurement of attitude is a significant predictor in determining the intention to conduct the behaviour.

The aforementioned constructs suggest that the Theory of Planned Behaviour (TBP) should be applied as the theoretical framework to the study. This theory is beneficial to use in the development of actions to promote the adoption of a healthier lifestyle. Ajzen (1991) developed a model through which human processes are constructed. Through this, the manifestation of a particular behaviour may be anticipated, provided that this behaviour was conducted intentionally. An outline of the model is presented in Figure 5.

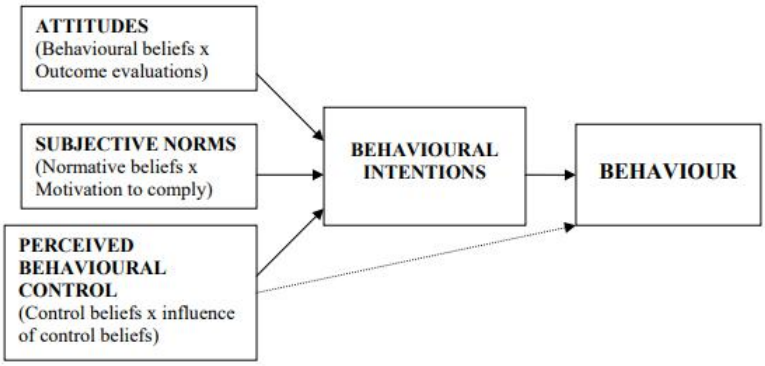


Figure 5. An outline of the Theory of Planned Behaviour (Ajzen, 1991)

This theory is established upon three conceptually independent determinants of intention. The first includes the person's attitude, therefore, the extent to which one is in favour of or against carrying out the action. The subjective norm refers to the pressure that the person feels to carry out the action. One's perceived behavioural control (PBC) refers to the extent to which one discerns themselves to be in control of performing the action, determined through past experiences. Therefore, the greater the assertion of the attitude and subjective norm regarding the behaviour, and the

greater one's PBC is, then the greater the person's intention towards performing the intended behaviour.

The TPB also incorporates self-efficacy, defined by Bandura in his Social Cognitive Theory as one's perceived capacity to perform a particular behaviour (Bandura, 1986). Armitage and Conner (1999), however, differentiated between self-efficacy, which refers to one's intrinsic incentive, and the TPB, where one encompasses a degree of regulation over external elements related to the behaviour. Despite this, self-efficiency proved to be of epitome importance with regards to predicting behaviour and intention (Armitage and Conner, 1999).

This theory, however, lacks the construct regarding barriers which individuals may experience towards achieving their intentions. Puhringer et al. (2015), Keogh et al. (2017) and Haussmann et al. (2018) emphasised that oncology nurses were experiencing barriers which prevented them from conducting the target behaviour to their patients. Therefore, the main perceived barriers which emerged from the aforementioned studies were included in this study so as to determine whether these affect the nurses' behavioural intentions.

The oncology nurses' evaluation of the target behaviour comprises their attitude towards it. Their attitude, according to the model, is composed of their understanding of the consequences of the behaviour (behavioural beliefs), and the desirable or undesirable conclusions drawn based on these aspects of their behaviour (outcome evaluations) (Francis et al., 2004). The subjective norms entail the nurses' evaluation concerning the demand they encounter regarding whether they conduct the target behaviour or not (Francis et al., 2004). This is comprised of two factors which have a synergistic relationship. The first encompasses the normative beliefs, which refers to the nurses' beliefs regarding how other healthcare professionals and the patients

themselves would expect the nurses to behave. The outcome evaluations, the second factor, involve the positive and negative self-appraisal regarding each belief. Therefore, the subjective norm may be achieved by asking the oncology nurses to determine the degree to which other HCP and their patients would approve or disapprove of them performing the target behaviour.

The PBC refers to the degree to which one considers themselves able to conduct the target behaviour. This is dependent upon control beliefs, which are brought about due to past experiences, and due to impressions regarding the target behaviour that the oncology nurses would have achieved from other colleagues. The latter may in turn enhance or lessen any anticipated predicaments related to conducting the target behaviour (Ajzen, 1991).

This indicates that beliefs regarding having favourable circumstances and the required resources are considered as underlying PBC in the same manner that beliefs regarding consequences to a behaviour are considered to be imperative in ascertaining attitudes towards that behaviour, and as normative beliefs are considered to be imperative in ascertaining subjective norms (Ajzen, 1991). In the context of the research question, this is concerned with the oncology nurses' confidence in their abilities to provide the target behaviour. The nurses' competence in achieving this is dependent upon the control they have upon successfully conducting the behaviour, previous experiences, and their self-efficacy in relation to being able to conduct the behaviour.

2.3 The search strategy

A thorough search of the literature was conducted between March 2020 and July 2020. Multiple databases were first searched using keywords and their Medical Subject Headings (MeSH terms) in order to obtain the largest number of highly relevant studies. The abstracts of the obtained studies were then analysed according to the eligibility criteria so as to determine whether their inclusion in the review is appropriate. Lastly, the appropriate critical appraisal tools were applied to each study to scrutinise for the risk of bias within and between the included studies.

The HyDi software, which is a platform of databases provided by the University of Malta, was utilised to obtain relevant databases to conduct this search. Six databases were selected which include Academic Search Complete, CINAHL Complete, Cochrane Central Register of Controlled Trials (CCRCT), Cochrane Database of Systematic Reviews (CDSR), MEDLINE and PubMed. Google Scholar was also used as a search engine to aid to retrieve any further studies. Furthermore, the reference lists of the eligible studies were analysed so as to determine whether any additional studies could be retrieved. Throughout the process, an Excel sheet was maintained to record the search terms used in each database and search engine, as well as the number of hits for each search.

2.3.1 Eligibility criteria

The significance of establishing eligibility criteria is apparent in order to appraise the suitability of the review and to conduct the search strategy in an

unbiased manner (Moher et al., 2009). A table detailing the inclusion criteria along with a rationale for each when applicable can be found in Table 1.

Inclusion Criteria	**Rationale**
No date restrictions	To increase the probability of finding studies relevant to the research question
Unpublished studies	To decrease the likelihood of publication bias
Studies published in English or Maltese	While this may possibly introduce language bias, these languages are the only two which are thoroughly comprehended. For this reason, any studies conducted in another language other than the aforementioned were documented but excluded from this review.
Studies utilising only a quantitative research design shall be considered	To obtain all relevant quantitative data as only this is relevant to this research study
Studies that deal with the nutritional management and promotion of physical activity in oncology patients at any point during their cancer trajectory	To aid in determining whether there is an opportune time to conduct the necessary assessments and promote PA in these patient population
Studies that included the promotion of any form of physical activity	
Studies that included patients receiving any form of treatment or not on any treatment during the time that the study was being conducted	

Table 1. Eligibility criteria applied to the literature review

2.3.2 Keywords and their MeSH terms

The main key concepts were obtained from the research question itself. These were then translated into keywords to be used in the search strategy. Furthermore, these keywords' synonyms, alternative terms and MeSH terms were obtained so as to increase the likelihood of retrieving all relevant studies. A list of the keywords used and their alternative search terms are found in Table 2.

Keywords	**Alternative terms**
Oncology nurses	'Cancer nursing'; 'Oncological nursing'
Knowledge	'Metacognition'; 'Understanding'; 'Awareness'; 'Education'; 'Expertise'
Attitudes	'Mental outlook'
Perceived barriers	'Obstacle'; 'Obstruction'; 'Impediment'
Nutrition assessment	'Nutrition index'; 'Nutritional index'; 'Nutritional indexes'; 'Nutritional indices'; 'Nutrition requirements'
Physical activity	'Exercise'; 'Physical exercise'
Oncology patients	'Cancer patient'

Table 2. List of keywords and their alternative search terms

The Boolean Operator 'AND' and 'OR' were utilised to combine search terms to ensure that all relevant studies are obtained while lessening the likelihood of attaining insignificant studies. In the aforementioned databases, the advanced search option was available whereby three fields were available with the use of the 'AND' Boolean Operator between each. When searching in PubMed and Google Scholar,

the advanced search option was utilised whereby the field to only attain studies that include the keywords in their title was selected. This was done as utilising the basic search option would have resulted in obtaining a vast amount of mostly irrelevant studies, deeming it impossible to analyse the title of each. Therefore, the keywords and their alternative terms where searched in the following manner and yielded the following results, as illustrated in Table 3.

Key terms used	Academic Search Ultimate	CINAHL Complete	CCRCT	CDSR	Medline	Pubmed	Google Scholar
"oncology nurses OR oncology nursing OR oncology" AND "knowledge OR education OR understanding OR awareness" AND "nutrition assessment"	67	24	6	0	70	4	3
"oncology nurses OR oncology nursing OR oncology" AND "perceived barriers OR barriers" AND "nutrition assessment"	5	2	0	0	11	0	0
"oncology nurses OR oncology nursing OR oncology" AND "perceived barriers OR barriers" AND "physical activity or exercise or fitness or physical exercise"	223	68	24	0	206	4	2

"oncology nurses OR oncology nursing OR oncology" AND "attitudes OR perceptions OR opinions OR thoughts OR feelings OR beliefs" AND "nutrition OR diet OR food OR nourishment OR food intake OR eating"	950	304	90	0	704	8	1
"oncology nurses OR oncology nursing OR oncology" AND "attitudes OR perceptions OR opinions OR thoughts OR feelings OR beliefs" AND "physical activity or exercise or fitness or physical exercise"	737	133	131	2	482	4	4
Total number of studies:	**1982**	**531**	**231**	**2**	**1473**	**20**	**10**

Table 3. Keywords and their alternative terms used in the search strategy

2.3.3 Study selection

In order to ensure that the studies were selected in a systematic process, the Preferred Reporting Items for Systematic Review and Meta-analysis protocols (PRISMA) was followed. Through this search, seven studies which investigated the oncology nurses' beliefs, attitudes and perceived barriers towards the nutritional assessment and/or promotion of PA in oncology patients were obtained. Following a manual search through the reference list of these studies, one further study was obtained. Due to the fact that this is an understudied research topic, the eligibility criteria were altered to also include studies that investigated the beliefs, attitudes and perceived barriers of all nurses towards nutritional assessment and the promotion of PA of all patients, including those that have not been diagnosed with cancer. This resulted in the attainment of another study.

As a result of this search, a total of 4249 studies were obtained. The bibliographic management software RefWorks was utilised to save details regarding the obtained studies. The latter were all coded and their details were input into a Microsoft Excel spreadsheet where any duplicates would be identified and removed. This was attained by selecting the 'Remove Duplicates' option under the 'data' tab. Eliminating these duplicates resulted in 567 studies, the titles and abstracts of which were screened to remove irrelevant studies. This resulted in encompassing 26 studies, the full text of which were read, resulting in the elimination of a further 17 studies due to these not conforming to the aforementioned inclusion criteria. Therefore, 9 studies were attained to be appraised for this literature review. This process was recorded in the PRISMA flow diagram (Figure 6).

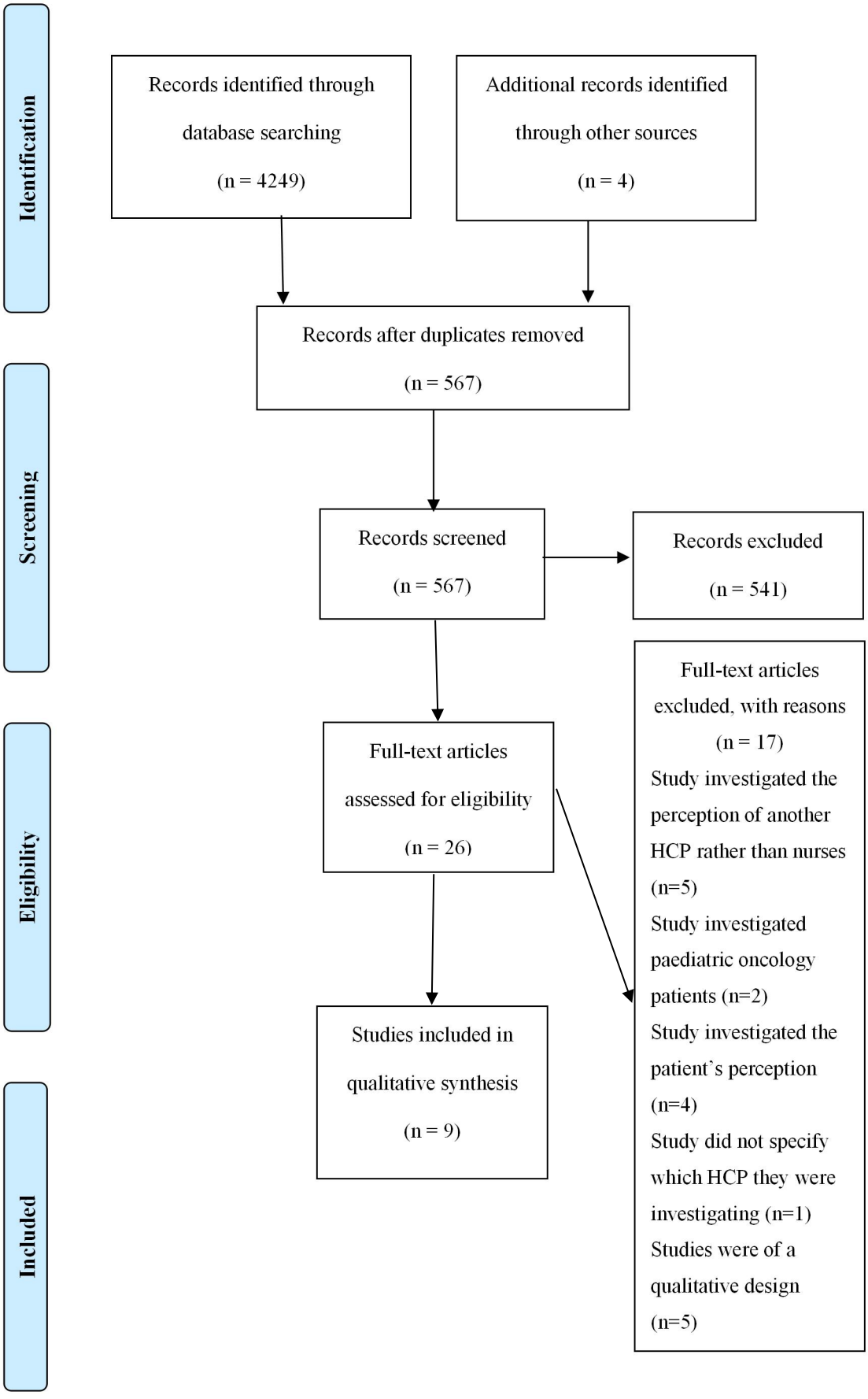


Figure 6. PRISMA flow diagram as published by Moher et al. (2009)

2.3.4 Study characteristics

From the conducted search, nine studies which adopted a cross-sectional design were retrieved. The sample size ranged from 119 participants in the study by Keogh et al. (2017) to 398 participants in the study by Ungar et al. (2019). The participants were predominantly female in all studies. Further demographic information as well as characteristics of the included studies are detailed in Table 4 below.

Study	Puhringer et al. (2015)	O'Hanlon & Kennedy (2014)	Keogh et al. (2017)	Papier et al. (2017)	Haussmann et al. (2018)	Williams et al. (2015)	Tsiouris et al. (2018)	van Veen et al. (2017)	Ungar et al. (2019)
Participants	Registered cancer nurses providing medical support to cancer patients in Australia and New Zealand	Members of the Irish Association for Nurses in Oncology (IANO; non-profit organisation)	Australian oncology nurses who routinely work with patients with cancer	Head nurses who worked morning shifts in the departments of internal medicine, surgery, intensive care, orthopaedics, dermatology, and gynaecology	Different groups of HCP having regular contact with breast, prostate or colon cancer in inpatient and outpatient care (only oncology nurses will be considered)	Health professionals, oncology nurses and allied health care professionals (only oncology nurses considered)	Oncology nurses who had regular contact to survivors with breast, prostate, or colon cancer	Nurses working in the oncology setting	Nurses treating patients diagnosed with breast, prostate, or colorectal cancers
Method of recruitment	Australian nurses were invited via links to the questionnaire posted on the Cancer Nurses	President of the organisation granted permission to use all members. The link to the	Access to a link to an online survey on the Cancer Nurses Society of Australia website or by	All nurses employed during morning shifts in the departments of internal	Hospitals with an oncological treatment focus were randomly selected from a German database and	Link to an online survey sent to nurses through the UK oncology Nursing Society as well	A sample was randomly drawn on basis of compulsory listings of hospitals in Germany. The	A hyperlink to an online survey was distributed via direct mailing or via a	Certified breast, prostate, and colon cancer centres were randomly

	Society of Australia and New Zealand nurses were invited via email from the Cancer Nurses Section of the New Zealand Nurses Organisation. Any registered nurses providing care to cancer patients were invited to participate through the social media platforms of Twitter and Facebook	survey conducted using SurveyMonkey was sent via email to the secretary of the IANO who then forwarded this email to all members.	responding to an email from the Cancer Nurses Section of the New Zealand Nurses Organisation. Other registered nurses providing care to patients with cancer but who were not members of the organizations were also eligible to participate and were recruited via links posted on Twitter and Facebook.	medicine, surgery, intensive care, orthopaedics, dermatology, and gynaecology were asked to participate in a study regarding nutritional treatment in their department; those who agreed were given a questionnaire.	contacted by phone via secretaries or nursing services. The link to the online questionnaire was promoted in medical journals and webpages of physicians' and nurses associations.	as through existing NHS contacts	number of potential participants and hospitals that were contacted in each of the 16 German states was selected proportionately to its population. Some questionnaires were also handed out at different national medical congresses in 2016. Also promoted the online questionnaire in in different	newsletter through different oncology nursing networks in the Netherlands.	selected from official registers, and recruitment at medical congresses through medical journals and professional mailing lists.

							magazines, newsletters, or homepages for nursing staff		
Sample size	123 (male: 5; female: 117)	58 (98.3% female) - 34% response rate as 170 nurses were initially recruited	119 (male: 5; female: 113; unspecified: 1)	100 (female: 86; male: 14)	388 (male: 69; female: 312)	126	386 (male:68; female: 311)	458	398 (male: 69; female: 322)
Study instrument	Online questionnaire	Online questionnaire	Online questionnaire	Online questionnaire	Self-report paper-pencil and a congruent online questionnaire	Online web-based survey	A paper pencil questionnaire or a congruent online questionnaire	An online questionnaire	A paper-pencil or a congruent online questionnaire
Pilot study conducted	Yes	Yes	No	No	Yes	No	Qualitative pre-test done to construct a scale for the perception of contraindicatio	No	Qualitative and quantitative pre-test done to develop variables of

							ns		the TPB
Time for data collection	Australian: 9 months New Zealand: 7 months	10 weeks	Not provided	Data collected on the day that the questionnaire was provided	Not provided	Not provided	6 months	3 months	Stated that between 2016 and 2017
Educational qualifications provided	Yes (degree: 34; diploma: 55; master's degree: 33)	No	Yes (degree: 39; diploma: 52; master's: 28)	Yes (69% had a degree)	No	No	No	Yes (university: 36; higher vocational: 255; int. vocational: 28)	No
Years of experience in oncology setting provided	Yes (<5 years: 8; 5-14.9 years: 27; 15-24.9 years: 27; ≥25 years: 59)	Mean of 14 years (±4.8) in oncology and/or palliative care	Yes (<5 years: 6; 5–14.9 years: 28; 15-24.9 years: 27; ≥ 25 years: 57)	Yes (52% had more than 15 years, 29% between six and 14 years, and 1% five years of experience or less)	Yes (< 15 years: 154; ≥15 years: 226; average: 19.19 ±10.46)	No	Yes - mean years 19.3 ± 10.5 (<15 years: 153; >15 years: 233	Yes (>25 years: 13, <5 years: 100; 6-15 years: 105, 16-25 years: 28; missing data: 81)	Yes - mean 19.20 ± 10.49

Nursing grade provided	No	Yes	No	No	No	No	No	No	No
Cancer group specialisation provided	Yes (general: 48; gynaecological: 21; urogenital: 7; palliative: 7; lung: 6; gastrointestinal /colorectal: 6; other: 20)	No	Yes (general: 48; gynecologic: 21; urogenital: 7; palliative: 7; lung: 6; gastrointestinal /colorectal: 6; other: 21)	N/A	Yes (breast: 54.4%; prostate: 51.5%, colorectal: 63.9%; lung: 57.2%; other: 50.5%)	Yes - provided as percentage for all participants, so cannot be traced to just the nurses' characteristics	Just stated that they had to have regular contact with survivors with breast, prostate, or colon cancer	No	Yes (colorectal: 63.8%; breast: 54.5%; prostate: 51.5%; lung: 57.8%; other: 50.3%)
Nurses' lifestyle habits assessed	Yes - current smoking status, dietary choices and frequency of physical activity	No	Yes - frequency of physical activity, healthy eating habits, and smoking status	No	No	No	No	No	No
Assessed beliefs towards	Yes	No	No	Yes	No	Yes	No	Yes	No

nutritional management									
Assessed attitudes towards nutritional management	Yes	No	No	Yes	No	Yes	No	Yes	No
Assessed perceived barriers towards nutritional management	Yes	No	No	Yes	No	Yes	No	Yes	No
Assessed beliefs towards promotion of physical activity	No	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes

Assessed attitudes towards promotion of PA	No	No	Yes	No	Yes	Yes	Yes	Yes	Yes
Assessed perceived barriers towards promotion of PA	No	Yes	Yes	No	Yes	Yes	Yes	Yes	No

Table 4. Characteristics of included studies

2.4 Risk of bias within studies

In order to determine the risk of bias within the obtained studies, a critical appraisal of these using the BMJ Open Appraisal Tool for Cross-Sectional Studies (AXIS) was utilised (Appendix A). The authors of all included studies presented the aims and objectives of the study in a clear and defined manner. The employment of a cross-sectional design was considered to be appropriate for all studies since these aimed to obtain data regarding the population at one point in time (von Elm et al., 2007).

The choice of sample size is important as it has an extensive effect on the significance of the study outcomes (Woodward, 2004). Neither of the studies provided details regarding a sample size justification or power description. Therefore, it may not be determined whether the sample size in each study is too small, and whether the conclusions that have been drawn are under powered due to the failure of exposing an effect which legitimately exists (Woodward, 2004).

All studies provided a clear definition of what their target population entailed. In the studies by Puhringer et al. (2015), Williams et al. (2015), Keogh et al. (2017), van Veen et al. (2017) and O'Hanlon and Kennedy (2014) there might be a limitation in determining the accuracy of the sample frame utilised due to the fact that if any nurses did not form part of the society from which the participants were recruited, then they would not have been invited to participate (Lohr, 2008). This raises concerns as to whether the sample is representative of the whole population. Haussmann et al. (2018), Tsiouris et al. (2018) and Ungar et al. (2019) only included nurses who had regular contact with patients with breast, prostate or colon cancer. Therefore, this sampling frame is not fully representative since other cancer group

specialisations were excluded. Tsiouris et al. (2018) aimed to minimise this limitation by allowing volunteers to participate. Lastly, since Papier et al. (2017) only included nurses who were working a morning shift on the day that the study was being conducted, there is an increased likelihood that the sample is not representative. This is because many variables may affect the demographic aspect of the nurses which were working on that day.

The risk of selection bias must be appraised by analysing the selection process which was adopted. This is carried out to establish whether this process was executed in a manner whereby the likelihood of selecting participants that are representative of the population is ascertained (Tripepi et al., 2010). Despite the risk of selection bias being low in the studies by Puhringer et al. (2015), Keogh et al. (2017), Haussmann et al. (2018), van Veen et al. (2017) and O'Hanlon and Kennedy (2014) since participants were recruited from organisations, a degree of bias may still be present in each due to aforementioned reasons. In the studies by Puhringer et al. (2015) and Keogh et al. (2017), the researchers aimed to reduce the possibility of this bias by allowing nurses to also be recruited through social media. However, it may not be guaranteed that the nurses who do not form part of these organisations will encounter the link to the survey on any social media platform. The risk of selection bias is high in the study by Papier et al. (2017) since these only allowed the inclusion of nurses who worked in particular departments in just one particular hospital (Yu & Tse, 2012). This risk is low in the study by Tsiouris et al. (2018) since participants were selected via random sampling from hospital listings.

Furthermore, the risk of self-selection bias may also be present in nurses who do not perceive themselves as encompassing a healthy lifestyle, or in those who do not prioritise the promotion of a healthy lifestyle, as these will be less likely to

participate. Therefore, there may be an over representation of nurses who encompass healthy lifestyle habits which may produce biased results. This was accounted for by Tsiouris et al. (2018) who in turn, promoted the study as focusing on supportive strategies during cancer treatment. Self-selection bias may also present in the study by van Veen et al. (2017) if the nurse does not perceive themselves as having adequate knowledge regarding nutrition and PA for cancer survivors. Therefore, there may be over representation of nurses who are more knowledgeable regarding the matter.

The importance of appraising whether non-responders were accounted for is established due to the fact that their characteristics may contrast with those who responded. As a result, inaccuracies regarding population characteristics may ensue due to their under-representation as a result of non-response error (Cheung et al., 2017). Keogh et al. (2010) accounted for this by demonstrating the number of respondents for each question. Haussmann et al. (2018) established a recruitment flow to display the number of non-responders. Therefore, the risk of obtaining results that don't represent the target population due to a shift in baseline data as a consequence of non-response in the studies by Puhringer et al. (2015), O'Hanlon and Kennedy (2014), Williams et al. (2015), Tsiouris et al. (2018), van Veen et al. (2017) and Ungar et al. (2019) is present, despite the degree to which being unknown.

Measurement reliability is important as it ascertains that the tool conveys consistent results through its repeated use (Gliner & Morgan, 2001). The tools employed in the studies by Puhringer et al. (2015), O'Hanlon and Kennedy (2014), Haussman et al. (2018) Tsiouris et al. (2018) and Ungar et al. (2019) all encompass measurement reliability as the authors had conducted a pilot study. The questionnaire used by Papier et al. (2017) was developed based on a previous questionnaire

published by the Critical Care Nutrition at the Clinical Evaluation Research Unit. However, since the one used by the researchers was an adaptation of this, its reliability cannot be accurately determined.

Despite Keogh et al. (2017) not having conducted a pilot study, their tool still encompasses high measurement reliability since they adopted the same study instrument as the one used in the study by Puhringer et al. (2015) but adapted it towards the promotion of PA. However, it may not be determined whether the tool used in the studies by Williams et al. (2015) and van Veen et al. (2017) measured the appropriate outcome variables using the correct measurement tool. This is due to the fact that while the authors provided a description that implies that the correct questions were asked in their survey they failed to employ a theoretical framework or conduct a pilot study.

All studies provided the methods used to determine statistical significance as well as provided details regarding the statistical methods employed. Furthermore, the response rate and whether any information was provided regarding non-responders must be further scrutinised so as to determine whether this may be of any concern with regards to non-response bias in the results. The latter would have occurred if the non-responders vary significantly from the rest of the population in the sample (Sedgwick, 2015). Puhringer et al. (2015), Keogh et al. (2017), Williams et al. (2015) and van Veen et al. (2017) failed to provide the response rate of the study as it was unclear how many participants were invited to participate initially. Therefore, a high possibility of non-response bias is present. O'Hanlon and Kennedy (2014) and Haussmann et al. (2018) stated that their studies encompassed a response rate of 34% and 30.7% respectively. Due to the low response rate and also due to the fact that no further information was provided regarding the non-responders, it may

not be excluded that these non-responders could have differed extensively from the rest of the sample. Despite Ungar et al. (2019) and Tsiouris et al. (2018) stating that a response rate of 30.2% and 30.8% were obtained for the paper and pencil questionnaire of each respective study, the researchers failed to provide the response rate pertaining to the online questionnaire, suggesting that there is a high potential of non-response error.

Encompassing internally consistent results is also important, and researchers must provide information regarding any missing data. This consistency was not observed in the studies by Puhringer et al. (2015), O'Hanlon and Kennedy (2014) and Haussmann et al. (2018) due to missing demographic data as a result of non-response as well as frequencies that do not add up to the total number of participants. O'Hanlon and Kennedy (2014) and Papier et al. (2017) aimed to tackle this issue by establishing a percentage of how many nurses would have answered a particular question. Internal consistency was observed in the studies by Keogh et al. (2017) and Williams et al. (2015). In the study by van Veen et al. (2017), the total number of participants who responded to the questions regarding the nutritional aspect of the study was not equal to the number of those who responded to the questions regarding the PA aspect. Therefore, the authors aimed to ascertain that internal consistency is established by presenting the frequencies of their results according to the total number of respondents of each aspect of their study. Moreover, all included studies presented the results for all conducted analysis. This suggests that there is a very low potential for having found insignificant results which were omitted, which in turn, would have resulted in an overestimation of the results (Von Elm et al., 2007).

An essential component of this appraisal includes the analysis of whether the researchers' presented discussions and conclusions drawn were substantiated by the attained results. All studies except the one by Ungar et al. (2019) discussed all results, even insignificant ones, that pertain to the aim of the study. This suggests that the researchers did not attempt to mask any controversial results. Deliberating non-significant results is of epitome importance since these also have a direct association with the studies' aims since these may be brought about due to errors in the sample size. Since the latter was a potential concern in all studies, this was reduced through its acknowledgement (Zangirolami-Raimundo et al., 2018).

Furthermore, the researchers should discuss any selection bias that might be present in their study when interpreting their results. However, this was only discussed by Haussman et al. (2018), van Veen et al. (2017), Tsiouris et al. (2018) and Ungar et al. (2019). Puhinger et al. (2015), O'Hanlon and Kennedy (2014) and Haussmann et al. (2018) included a discussion regarding how the possibility of non-response error may have affected the significance of their attained results while the other researchers failed to do so.

A confounding factor is one which is correlated to both the exposure and the outcome being explored, and must not be in the causal trajectory between exposure and outcome and may result in misinterpretations of the association between the exposure and the outcome (Austin, 2011). Puhinger et al. (2015) and Keogh et al. (2017) accounted for the fact that the nurses' own lifestyle behaviours could influence the degree to which nutritional and PA promotion take place and therefore, could be a potential confounding factor. By gaining information regarding the nurses' lifestyle behaviours in their survey, this factor was reduced. van Veen et al. (2017) establish that a confounding factor might include the fact that nurses who

participated may have been more interested in nutrition and PA, which in turn may suggest that they would have educated themselves more regarding the subject, therefore being more knowledgeable than other nurses.

However, a potential confounding factor in the studies by Puhringer et al. (2015), O'Hanlon et al. (2014), Keogh et al. (2017), Haussmann et al. (2018), Ungar et al. (2019) and Tsioris et al. (2018) is the fact that a vast majority of the sample includes females. Therefore, it may not be determined whether gender is a factor which influences their beliefs and attitudes nutritional and PA promotion to their patients. Only O'Hanlon and Kennedy (2014) and Papier et al. (2017) provided the nursing grade of each participant, as they accounted for the fact that this potential confounding factor affects the amount of contact that nurses may have with patients, and therefore may influence their attitudes and the degree to which PA may be promoted by these nurses. The cancer specialisation within which oncology nurses work may also have an effect. Since this confounding factor was not discussed in the studies by O'Hanlon and Kennedy (2014) and Williams et al. (2015), it cannot be determined whether this variable affected the significance of the outcome.

The sample in the study by Hausmann et al. (2018) and Papier et al. (2017) included oncology nurses and general nurses, respectively, who encompassed a high average years of experience. The researchers failed to discuss this as a potential confounding factor in their study. Lastly, since O'Hanlon & Kennedy (2014), Williams et al. (2015), Haussmann et al. (2018) Tsiouris et al. (2018) and Ungar et al. (2019) did not provide the highest educational qualification obtained by the oncology nurses in their sample, it may not be deliberated whether this may be a confounding factor. The latter would have also aided to potentially recommend the introduction of

educative interventions so as to enhance nurses' beliefs and reduce any potential perceived barriers towards the warranted behaviour.

2.5 Risk of bias across studies

Table 5 illustrates the risk of bias between the appraised studies. A 'yes' reply signifies a positive appraisal, while a 'no' reply signifies a negative appraisal.

being appraised	Author and Year of Publication	Adequate focused question	Adequate sample size	Adequate eligibility criteria	Adequate outcome measurement	Confounding variables acknowledged	Stratify analysis by covariates
Study authors and year of publication of study	**Puhringer et al. (2015)**	Yes	Can't tell	Yes	Yes	Yes but not all	Yes
	O'Hanlon & Kennedy (2014)	Yes	Can't tell	Yes	Yes	Yes but not all	No
	Keogh et al. (2017)	Yes	Can't tell	Yes	Yes	Yes but not all	Yes
	Haussmann et al. (2018)	Yes	Can't tell	Yes	Yes	No	Yes
	Williams et al. (2015)	Yes	Can't tell	Yes	Can't tell	No	Yes
	Tsiouris et al. (2018)	Yes	Can't tell	Yes	Yes	Yes	No
	van Veen et al. (2017)	Yes	Can't tell	Yes	Can't tell	Yes	No
	Unagar et al. (2019)	Yes	Can't tell	Yes	Yes	No	No
	Papier et al. (2017)	Yes	Can't tell	No	Can't tell	No	No

Table 5. Risk of bias across studies

2.6 Results of individual studies

2.6.1 Results regarding oncology nurses' beliefs, attitudes and perceived barriers towards nutritional management

Puhinger et al. (2015) aimed to determine oncology nurses attitudes towards nutritional management by inquiring these nurses regarding who they consider the person responsible for this behaviour. From this population, 35% stated that they considered this to be the nutritionist/dietician. However, 32.5% of nurses considered themselves as being the ones responsible. Moreover, 74.8% of nurses established that nutritional management is mostly conducted during the period in which the patient is receiving their treatment, while 52.8% of nurses reported conducting this behaviour throughout the cancer trajectory. There were no significant differences between nurses who have been practising for less than 25 years and those who have been practising for longer. Papier et al. (2017) established that 63% of nurses reported that they perceive themselves to be responsible for this behaviour. Moreover, 93% ascertained that they ensured that they were directly involved in the nutritional care provided. 53% of the nurses in this sample had more than 15 years of professional experience.

With regards to the nurses' beliefs on the matter, most of them agreed or strongly agreed that the nutritional management of oncology patients results in an enhanced HRQoL (35% and 50.4%), weight management (30.9% and 52%), mental health (39% and 41.5%), ADLs (40.7% and 39%,) as well as in the decrease of risk of cancer recurrence (45.5% and 25.2%), the risk of other chronic diseases (43.9% and 35.8%) and the risk of cancer-specific co-morbidities (43.1% and 20.3%)

(Puhringer et al., 2015). Furthermore, 61% of nurses strongly disagreed and 7.3% disagreed regarding the belief that nutritional management has no perceived benefits to oncology patients (Puhringer et al., 2015).

75.5% of the nurses also claimed that they were knowledgeable regarding nutritional management. These findings contrast with those obtained by van Veen et al. (2017) as 43% of nurses established that they encompass insufficient knowledge. Both studies included nurses where the majority had a greater number of years of experience. Older nurses with more experience were more inclined towards perceiving themselves as being knowledgeable [OR 1.03, 95% CI (1.01-1.06)] (van Veen et al., 2017). Moreover, nurses who did not encompass a university degree [OR 0.36, 95% CI (0.14-0.19)] and those who ensured nutritional management only while the patients were receiving treatment as opposed to throughout the whole trajectory [OR 0.52, 95% CI (0.29-0.94) encompassed a reduced probability of perceiving themselves as having sufficient knowledge. The latter recommended visiting a dietician more often than those with perceived knowledge ($p=0.03$).

Puhringer et al. (2015) established that 59.4% of nurses acknowledged that their colleagues also expected other oncology nurses to be responsible towards ensuring nutritional management. Moreover, the majority of the nurses disagreed and strongly disagreed (59.3% and 10.6%) that patients were unconcerned regarding their nutritional status.

The barriers to providing the optimal nutritional care to were scrutinised. Encompassing a lack of time was cited as the greatest barrier by Puhringer et al. (2015) with 25.8% of nurses agreeing to this. Williams et al. (2015) also recognised this [OR 0.72 (0.45-1.17 95% CI), $p<0.05$). This concept was explored by Papier et al. (2017) as there being a barrier with regards to the time it takes to identify patients

that require nutritional management (52%, p<0.0001) and the time it takes to initiate the nutritional care that the patient requires (49%, p=0.007). Another barrier pertains to a lack of adequate support structures in the study by Puhringer et al. (2015) (17.3% of nurses) and in the study by Williams et al. (2015) [OR 0.39 (0.23-0.65 95% CI), p<0.001].

A lack of expertise was also cited by 12.2% of the nurses, as well as a lack of knowledge in 4.4% of the nurses (Puhringer et al., 2015). A chi-squared analysis of group differences revealed that the latter was more commonly cited by the nurses who were less experienced (p=0.0001). Papier et al. (2017) also stated that 42% of the nurses lacked knowledge regarding their patients' nutritional requirements (p=0.003). Veen et al. (2017) highlighted that younger nurses and those who care for patients while these are receiving treatment, should undergo nutritional education which should aim to include the nurses' responsibility to patients' nutritional care, as while only 2.2% of nurses in the study by Puhringer at al. (2015) claimed that nutritional care was not their role to conduct, Williams et al (2015) reported statistical significance to this barrier [OR 0.54 (0.32-0.90 95% CI), p<0.05]. Furthermore, issues regarding lack of clear guidelines are indicated in the study by Williams et al. (2014) [OR 0.39 (0.23–0.65 95% CI), p<0.001) who state issuing these would aid in ensuring that professional boundaries are maintained.

Williams et al. (2015) established that nurses believed that provision of nutritional care does not affect cancer outcomes [OR 0.41 (0.23-0.74 95% CI), p<0.01]. Lastly 31.6% of nurses in the study by Puhringer et al. (2015) did not report experiencing any barriers towards nutritional management. However, this was more commonly cited by nurses who were more experienced (p=0.045). This further emphasises the need for educational intervention for younger nurses.

2.6.2 Results regarding oncology nurses' beliefs, attitudes and perceived barriers towards the promotion of PA

Keogh et al. (2017) aimed to determine oncology nurses attitudes towards promotion of PA. Oncology nurses who have been practising for less than 25 years (p=0.439) and those that have been practising for longer (p=0.439), considered themselves to be responsible for promoting PA. Therefore, their years of practice had no significant impact on their belief towards who should be promoting PA. However, Williams et al. (2015) highlighted that nurses over the age of 45 were more likely to promote PA to their patients [OR 2.04 (95% CI 1.11-3.75), p<0.005].

Haussmann et al. (2018) established that most nurses report promoting PA either routinely (32.3%) or often (40.8%), while only 7% of nurses stating that they never or rarely promote PA, and only 0.3% claim to advise against it. Tsiouris et al. (2018) stated that 40% of nurses promote PA 50-90% of the time that they come into contact with their patients, and 32% of nurses promote PA on nearly every visit with their patients. In the study by Keogh et al. (2017), the findings suggest that more than half of the nurses who participated in the study promoted PA pre-treatment (67%), during treatment (84%) and post-treatment (80%).

O'Hanlon and Kennedy (2014) investigated oncology nurses' attitudes regarding their current knowledge. Only 33% of these nurses agreed or strongly agreed that they encompass the necessary knowledge to conduct this behaviour. van Veen et al. (2017) also highlight that 46% of nurses report having insufficient knowledge. However, the latter found no significant differences between the educational content that was provided by the group of nurses who perceived to have insufficient knowledge on PA and those who perceived to be knowledgeable. This content

included advising the patient to start exercising, to liaise with a physiotherapist, to attend a rehabilitation programme and to balance their time between resting and exercising. No significant differences were also observed when the content of PA advice and the nurses' perceived insufficient knowledge was compared to the nurses' characteristics (van Veen et al., 2017). These findings reflect those established by Williams et al. (2015) whereby 51% of nurses were not aware of current PA guidelines. Furthermore, knowledge regarding guidelines was associated with an increased likelihood of promoting PA [OR 2.17 (95% CI 1.35-3.39), $p<0.001$]. There were no significant differences between age or sex for knowledge regarding PA guidelines.

Due to the lack of available literature, it may be hypothesised that this occurrence is due to the fact that currently oncology nurses only provide basic information to their patients regarding PA, which may be perceived as general knowledge to them, in turn, affect their perception regarding the actual sufficiency of their knowledge (van Veen et al., 2017). Therefore, the number of nurses that do actually encompass sufficient knowledge on the subject may be lower than that obtained. van Veen et al. (2017) suggest that nurses should be educated regarding how to assess specific patient needs regarding PA and how to deliver the most suitable tailor-made advice. This may be achieved through online education, particularly due to the obtained significant data whereby both nurses who claimed having either sufficient or insufficient knowledge on PA advice reported referring to a local education-based website detailing guidelines pertaining to oncology care ($p<0.01$). Furthermore, Klemp et al. (2011) established that most nurses are already competent in using online learning resources. This suggests that using online

teaching methods would be a cost-effective and accessible method of educating oncology nurses on PA advice (Murphy et al., 2015).

In the study by Keogh et al. (2017), most of the nurses stated that they perceive the conduction of PA to encompass multiple benefits for their patients. When the nurses were asked to degree to which they agreed or disagreed to certain beliefs, these nurses stated that they strongly agreed and agreed that PA promotion aids in improving the patient's HRQoL (63% and 27%), mental health (65% and 25%) and conduction of ADLs (58% and 31%). The vast majority strongly agree and agree that PA promotion leads to a decrease in cancer recurrence (29% and 31%) and in tumour-specific co-morbidities (25% and 45%). No significant differences were present based on years of practice.

Moreover, 39% and 37% of oncology nurses strongly agree and agree, respectively, that promoting PA to their patients would be carrying out evidence based practice (Keogh et al., 2017). This may suggest that only some oncology nurses are aware of current literature regarding the benefits of the conduction of PA in oncology patients. This is also evident in the study by O'Hanlon and Kennedy (2014) as 41% of oncology nurses stated that they disagreed that they are not aware of current evidence pertaining to the promotion of PA, while 36% of these nurses agreed or strongly agreed to that statement. According to Keogh et al. (2017), 39% of nurses agree while 15% agree that the decision as to whether the promotion of PA occurs is entirely up to them. Lastly, Keogh et al. (2017) established that 54% of oncology nurses disagreed with the belief that their patients are uninterested in conducting PA. This may be achieved by providing the patient with multiple options that would best suit their own requirements.

Determining the oncology nurses' perceived barriers towards the promotion of PA is of ultimate importance so as to discover strategies that may be implemented to decrease these.Keogh et al. (2017) stated that 29% of participants reported that they did not experience any barriers. This suggests that these nurses may aid those who are experiencing barriers to overcome them. The primary barrier that emerged was that of encompassing a lack of time to deliver PA advice, as 28% of participants agreed to this statement. This may also be observed in the studies by Williams et al. (2015) [OR 0.60 (0.38-0.96 95% CI) ($p<0.05$)], Haussmann et al. (2018) [OR 0.60 (0.36-0.99 95% CI) ($p=0.045$)] and O'Hanlon & Kennedy (2014) where 39% of participants agreed to this statement. This barrier may be difficult to overcome due to the demanding schedule that nurses face. However, by establishing clear referral pathways where oncology nurses may refer more complicated cases to physiotherapists, this barrier may be overcome. The significance of this may be further reinforced due to the findings by O'Hanlon and Kennedy whereby 93% of their participants established that there is a lack of clear guidelines for PA promotion. These findings reflect those obtained in the study by Williams et al. (2015) where half of the population were not aware of any exercise guidelines [OR 0.31 (0.18-0.51 95% CI) ($p<0.001$)], and therefore are less likely to apply them. However, this did not reach statistical significance in the study by Haussmann et al. (2018) [OR 1.18 (0.73-1.92 95% CI) ($p= 0.500$)].

An alternative approach towards overcoming the aforementioned barrier would be by providing the nurses with accessible information which they may easily refer to. This is significant due to the finding in the study by Keogh et al. (2017) whereby having a lack of knowledge regarding PA promotion was cited as a barrier by 9% of the nurses. However, nurses who had more than 25 years of experience were less

likely to cite this (p=0.015). O'Hanlon and Kennedy (2014) also established that 78% of the participants claimed that a barrier includes the fact that patient's family and friends advise against exercising. This suggests that the patient's family should also be involved in the discussions in order for them to also understand the benefits based on evidence, and in turn, aid encourage the patient to undergo the appropriate PA as advised.

Williams et al. (2015) stated that another barrier is that the nurses believed that PA would not affect cancer outcomes [OR 0.42 (0.23-0.74 95% CI) ($p<0.01$)]. This barrier is associated with that pertaining to a lack of knowledge since research evidence regarding the benefits of PA to oncology patients has been published. Therefore, this hints that both barriers may be decreased by educating oncology nurses regarding the matter. Furthermore, a lack of expertise was stated to be a barrier by 18% of the sample in the study by Keogh et al (2017) and by the nurses in the study by Haussmann et al. (2018) [OR 0.58 (0.35-0.96 95% CI) ($p=0.035$)]. Since a test for group differences revealed a statistically significant result between groups for years of practice, it can be concluded that nurses with less experience deemed lack of expertise as a greater barrier than those who are more experienced. Therefore, experience and knowledge are both required in order to effectively decrease any hindrance from promoting PA.

Tsiouris et al. (2019) established that a barrier towards the promotion of PA is their fear of causing the patient to overexert themselves.The need to educate nurses regarding safe of PA recommendations, as well as the need to provide guidelines was also observed in the aforementioned study. Medical conditions were explored to determine whether they are regarded as contraindications to recommending PA. A high percentage of nurses agreed that PA should be contraindicated in patients who

are experiencing increased pain during exercise (49%), in those who have been diagnosed with vertebral bone metastases (41%), in patients who were experiencing incomplete wound healing (61%), who had leukopaenia (46%) and who had a platelet count of 50,000µl (55%). However, when oncologists were presented with the same medical conditions, they perceived these as less of a contraindication to PA than the nurses this. Therefore, this suggests that educating nurses regarding the fact that these conditions should not be perceived as a reason for advising against PA, but rather emphasise the significance of tailoring their recommendations according to the patient's requirements.

2.6 Conclusion

This literature review was the first of its kind to examine the oncology nurses' attitudes, beliefs and perceived barriers of nutritional management and the promotion of PA to oncology patients. From the conducted critical appraisal, it may be concluded that the reviewed studies generally encompassed a degree of risk of selection bias, non-response bias, selection bias, and a lack of internal consistency, thereby suggesting that the results of these studies should be interpreted with caution. Overall, the findings suggest that with regards to nutritional management of oncology patients, nurses considered themselves to be responsible for the conduction of this behaviour, irrespective of their years of experience. Moreover, they encompassed the beliefs that proper nutritional management of their patients results in them experiencing a greater HRQoL, decrease in risk of cancer recurrence and of cancer-specific co-morbidities. Older nurses with a greater number of years of experience were more likely to state that they were knowledgeable regarding the

behaviour. The greatest barriers that the nurses perceived themselves to have towards the conduction of nutritional management included a lack of time to identify patients that require a nutritional intervention and to initiate the required care, a lack of expertise and a lack of knowledge.

The findings pertaining to the promotion of PA suggest that the nurses considered themselves to be responsible towards promoting PA to their patients, with their years of experience having an insignificant effect on this attitude. Despite a great percentage of nurses reporting that they posses insufficient knowledge regarding PA promotion, the content that they provided did not vary from that provided by the nurses who claimed to be knowledge on the matter. The majority of the nurses also encompass the belief that promoting PA will aid in enhancing their patients' HRQoL and ability to conduct ADLs. Furthermore, the most common perceived barriers that the nurses experienced towards promoting PA included a lack of time with patients, believing that PA does not effect cancer outcomes and a lack of expertise.

Chapter 3:

Methodology

Chapter 3: Methodology

3.1 Introduction

This chapter outlines and explains the methodology employed in this research study. A discussion regarding the research design, sampling techniques used, the research instrument and how it was used for the most effective data collection is carried out. Moreover, the reliability and validity of this tool are determined through the conduction of a pilot study. The ethical considerations employed in this study as well as the data analysis that were utilised are also discussed.

3.2 Aims and objectives

The aim of this research study is to determine oncology nurses' attitudes, beliefs and perceived barriers towards nutritional assessment and management and the promotion of PA. The specific objectives of the research study are as follows:

- To explore oncology nurses' attitudes and behavioural beliefs so as to determine what they actually practice with their patients.
- To determine oncology nurses' current knowledge regarding nutrition and the conduction of physical activity in oncology patients.
- To investigate whether their knowledge will have an effect on whether they conduct these behaviours or not.
- To determine nurses' confidence in their abilities to provide good nutritional assessment and management and promote physical exercise as appropriate.

- To determine nurses' perceived structural barriers to delivering the necessary nutritional support and education regarding physical activity to their patients.
- To analyse whether the nurses' socio demographic factors affect their intentions, attitudes, knowledge, beliefs and perceived barriers towards carrying out the target behaviours.
- To identify significant predictors towards the willingness of oncology nurses towards the appropriate nutritional management and promotion of PA to oncology patients.
- To establish the most effective interventions/s to these nurses in a manner that ensures willingness towards learning and improving the quality of the patient care provided.

3.3 Materials and Methods

3.3.1 The chosen research design

A quantitative approach adopting a cross-sectional survey design was chosen in order to explore the aims of this research study. The utilisation of this research design was advantageous due to the encompassed ability of gaining statistical data. This aids in determining any associations between the demographic characteristics of the sample and their attitudes, behavioural beliefs and perceived barriers to the nutritional management and promotion of PA in oncology patients (Creswell, 2014). Attaining this information will in turn aid in determining the most appropriate

strategies to apply so as to decrease their perceived barriers towards the warranted behaviour.

A cross-sectional design is a form of an observational study design as the researcher is not able to amend the influence of the exposure (Setia, 2016). Therefore, the use of this design is appropriate to investigate the association between the outcome and an exposure in the chosen population (Creswell, 2014). Since data collection occurs only at one point in time, the employment of this study design is suitable for interpreting the relationship between exposures at a particular point in time (Polit & Beck, 2010). Employing a survey design aids by contributing numerical data regarding the attitudes of the sample of interest which may then be generalised to a greater population among other individuals with similar characteristics who did not participate in the study (Polit & Beck, 2010). Furthermore, the development of a survey allows the researcher to explore the participants' responses which best establish their perceptions (Mann, 2003).

3.4 Sampling

3.4.1 Population

For the purpose of this research study, the target population includes all nurses currently employed in the oncology section of SAMOC. These include staff nurses, senior staff nurses, deputy charge nurses, charge nurses and practice nurses. An intermediary (M.H.) who is a senior official within SAMOC) was identified in order to obtain access to the target population while still ensuring the latter's anonymity and confidentiality. This is because the researcher did not have direct access to this

particular data. M.H. informed the researcher that a total of 91 nurses were employed as oncology nurses at the time of the conduction of the research study. Therefore, 11 of these nurses formed part of the pilot study, while the other 80 nurses were invited to participate in the study.

3.4.2 Sample selection

For the purpose of this research study, a purposive sampling technique was employed. This technique is based upon the assumption that the researcher has the necessary knowledge regarding the population to select participants themselves. Due to the fact that it is a non-random sampling method, it is not concerned with known nonzero probabilities of selection, but rather, with the implication of utilising subjective means when determining which essential features are to be included in the sample (Lavrakas, 2008). Therefore, the use of this sampling technique was favoured for this research study as utilising a random sampling approach between participants that satisfy the eligibility criteria would have resulted in a very limited sample size (Polit & Beck, 2010). The eligibility criteria that lead to the selection of this sample are detailed in Table 6.

Inclusion criteria	**Exclusion criteria**
Oncology nurses who are ward-based	Nurses working in the haematology section of the oncology centre as the study deals with the nutritional and PA needs of oncology patients and not haematology patients
Oncology nurses who are based in the outpatients department	Nurses who are working as relievers in the oncology centre on a temporary basis as these would only be working in the oncology

	setting for a couple of weeks, and therefore do not qualify as oncology nurses
Oncology nurses who are relievers in all oncology wards/departments	Oncology nurses who care for paediatric oncology patients as the study focuses exclusively on the adult oncology patient population
Oncology nurses who encompass any level of educational qualification	
Oncology practice nurses who form part of the Practice Team or Cancer Care Pathways Directorate	

Table 6. Inclusion and exclusion criteria of study population

3.5 Method of data collection

Data collection ensued in the form of an online web-based survey, the link to which was sent to all oncology nurses on their work e-mail address by the intermediary. This method of data collection is advantageous due to the fact that it is cost and time effective since all nurses encompass an e-mail address provided by the workplace which is easily accessible by the chosen intermediary through an already available database (Jones et al. 2013). Through the use of an online software to develop the survey, the obtained results are automatically generated as statistical or graphical data, thereby allowing for data compilation to occur in a quick and effective manner. This further emphasises the time effectiveness associated with the utilisation of this method of data collection (Nayak & Narayan, 2019). Moreover, time effectiveness is further ensured due to the fact that the participants may begin the respond to the survey immediately after receiving the e-mail, thereby suggesting

that a rapid response rate is possible (Nayak & Narayan, 2019). The anonymity of the participants may also be assured, thereby decreasing the risk of participants introducing social desirability bias in their results (Roberts & Allen, 2015).

However, a low response rate has been correlated to utilising e-mails for a variety of reasons. Some participants may choose to ignore or delete an e-mail which they perceive to not be of interest to them. This limitation may be decreased by sending multiple reminder e-mails at different time intervals, so as to increase the likelihood of participant response (Michaelidou & Dibb, 2006). Furthermore, the construction of a survey which is not too lengthy without compromising the soundness of the data that is required to be collected is an effective strategy to counteract this limitation (Sahlqvist et al., 2011). For this reason, the time that is needed to complete the survey was kept to ten minutes and written in the introductory e-mail, as if the participants are aware of these requirements, the probability of them completing the survey is increased (Ganassali, 2008).

3.6 The research instrument

The research instrument to be used in this study was developed by the researcher utilising a manual published by Francis et al. (2004) aimed towards researchers in health care regarding the construction of a questionnaire based on the TPB, as mentioned in Section 2.3 (Appendix B). The first section of the questionnaire pertained to the acquisition of the demographic information of the sample. The demographic data collected was determined through the variables that may influence the study and construe the sample (Polit & Beck, 2010). Furthermore, through the presentation of this data, it may be ascertained whether the sample is representative

of the population. The demographic data gathered from the survey included the oncology nurses' age, gender, level of experience in the oncology setting, highest obtained level of education, their role in the oncology setting, their place of work within the oncology setting, timing of patient contact, frequency of engagement in PA, and the frequency of their promotion of PA to their patients within the previous three months.

The following section of the survey pertained to the measurement of the oncology nurses' behavioural intentions by determining their generalised intentions regarding nutritional management and promotion of PA. Armitage and Conner (2001) state that this may be achieved by determining the degree of agreement regarding what the participants expect, want and intend to do in relation to the behaviour under investigation. This was measured through the use of a 5 point Likert scale ranging from 'Strongly disagree' to Strongly agree'. The mean of these scores was then calculated to achieve an intention score.

The section of the survey pertaining to the measure of attitudes is calculated indirectly by measuring their behavioural beliefs and outcome evaluations (Francis et al., 2004). A number of perceived behavioural beliefs were presented as the aforementioned 5 point Likert Scale. Each belief statement was then converted into an incomplete sentence which is participants then had to complete using a different 5 point Likert Scale, ranging from 'Not at all important' to 'Extremely important', so as to convey a negative or positive evaluation of the belief statement, respectively. Therefore, a bipolar response scale ranging from -2 to +2 was achieved due to the bidirectional aspect that is being measured (Francis et al., 2004). An overall attitude score was then determined, whereby the belief score was multiplied by the evaluation score and calculated using the formula below:

$$A = (a \times e) + (b \times f) + (c \times g) + (d \times h)$$

whereby:

A is the total attitude score

a, b, c, and d represent the scores of each behavioural belief

e, f, g and h represent the scores of the outcome evaluations associated with each behavioural belief.

Through this method, obtaining a positive score would indicate that the participant is in favour of conducting the target behaviour, whereas obtaining a negative score would therefore indicate that the participant is against conducting the target behaviour (Francis et al., 2004). The measurement of the oncology nurses' attitude towards the promotion of PA was measured directly, using the 5 point Likert scale ranging from 'Not at all important' to 'Extremely important'. This was done as the incomplete statements used could be constructed for this survey based on previously conducted studies by Keogh et al. (2017), Nadler et al. (2017) and O'Hanlon and Kennedy (2014). The overall attitude was obtained by calculating the mean of the item scores.

The oncology nurses' knowledge through their subjective norms was measured using complete sentences and a 5 point Likert scale ranging from 'Strongly disagree' to 'Strongly agree'. Obtaining scores which are consistently higher here would indicate that the oncology nurse experiences a larger degree of social pressure to conduct the target behaviour (Francis et al., 2004). The overall subjective norm score will be obtained by calculating the mean of the item scores.

The oncology nurses beliefs' were then aimed to be established. This was achieved by evaluating their self-efficacy and the nurses' beliefs regarding the controllability of their behaviour (Francis et al., 2004). These factors were measured

using a 5 point Likert scale ranging from ‘Strongly disagree’ to ‘Strongly agree’. Acquiring scores which are consistently high suggest the oncology nurse would have a higher level of control over the target behaviour (Francis et al., 2004). The overall perceived behavioural control score was achieved by calculating the mean of the item scores.

Moreover, the degree of agreement between oncology nurses’ perceived barriers towards nutritional management and promotion of PA was then scrutinised using a 5 point Likert scale ranging from ‘Strongly disagree’ to ‘Strongly agree’. The barriers presented in the survey were adapted from previous studies by Puhringer et al. (2015), Keogh et al. (2017) and Haussmann et al. (2017). Following these questions, the participants also had the option to provide any other barrier which they perceive to encompass which may not have been included in the survey. Providing this opportunity of answering a question in an open-ended manner is advantageous as it allows the attainment of a more in-depth response which captures the participants attitude, and allows the provision of new insights which the researcher might not have accounted for (Fricker & Schonlau, 2002). These barriers were later analysed to determine any associations with previously obtained demographic information.

Lastly, the nurses’ willingness to increase promote nutritional management and PA was determined by asking this as a ‘Yes/No’ question. Furthermore, a choice of educational interventions were presented in order for the nurses to determine which they would be most likely to undergo. This aided to recommend the most appropriate method to promote continuous professional development in this population.

3.7 Reliability and validity of the study

The reliability of a study instrument refers to the consistency at which this tool measures a particular aspect (Polit & Beck, 2010). This indicates that the less variation there is between the obtained results through the repeated use of the same tool on the same sample, the greater the reliability of this tool. A tool is valid when it is determined that it truly does measure what was intended for it to measure (Polit & Beck, 2010).

3.7.1 Reliability

When exploring the reliability of a research instrument, the three factors which must be considered include its internal consistency, stability and equivalence (Polit & Beck, 2010). Since the survey used in this study was developed by the researcher, and therefore, has not been applied to any previous studies, its internal consistency had to be determined. This refers to the magnitude to which the items in the survey measure the same attribute (Polit & Beck, 2010). Cronbach's alpha was used to determine whether internal consistency was present. It is expressed as a value between 0 and 1, whereby if no correlation is present between items on the scale then $\alpha = 0$, and if items are highly correlated, then $\alpha = 1$ (Tavakol & Dennick, 2011). Therefore, the higher the obtained α coefficient, the greater the items are correlated, thereby measure the same attributes (Tavakol & Dennick, 2011). The minimum acceptable value that may be obtained to conclude that a tool is internally consistent is $\alpha = 0.7$. However, values equal to or greater than $\alpha = 0.8$ are usually preferred (Connelly, 2011). This measurement for internal consistency was conducted during

the pilot study, the details of which are explained later in this chapter. Eleven out of the twelve recruited participants answered the survey in the first phase of the pilot study. Since a Chronbach's alpha of 0.737 was obtained, this implies that the study tool is of acceptable internal consistency.

The stability component of the tool's reliability pertains to whether the tool is likely to be influenced by incidental factors over time (Polit & Beck, 2010). This suggests that the test-retest reliability must be determined by applying the same measure twice to the same sample, followed by a comparison of the obtained results (Polit & Beck, 2010). Therefore, the intraclass correlation (ICC) is calculated, which may range from 0 to 1, whereby the greater the obtained value, the more stable the tool is (Polit & Beck, 2010). Furthermore, a value above 0.7 is considered to be satisfactory, however, a value of 0.8 and greater is more desirable (Vilagut, 2014). Since am ICC of 0.968 was obtained, then the tool is considered to be very stable. The results are presented in Table 7.

	95% Confidence Interval		**F Test with True Value 0**			
Intraclass Correlation	Lower Bound	Upper Bound	Value	df1	df2	Sig
.968	.953	.980	31.291	44	945	.000

Table 7. Stability of tool using ICC

3.7.2 Validity

The face validity of the research tool, that is, whether the tool seems to be measuring the suitable elements was determined by this research's supervisor and by the university's dissertation proposal review board upon its initial submission. The content validity of the tool, that is, the extent to which the tool comprises of a suitable array of questions pertaining to the construct being measured, had to be

ascertained (Polit & Beck, 2010). This was achieved through the conduction of a content validity study by two experts, which included a senior practice nurse working in the local Cancer Care Pathways Directorate who is responsible for creating tools for nurse navigators, and the Assistant Director for healthcare services who has experience in auditing cancer services. The content validity index (CVI), that is, the extent to which a tool encompasses suitable sample of components being measured, was used to establish the validity of the research instrument (Shih et al., 2012). A definition of the CVI indices and other measurement indices that were utilised is provided in Appendix C.

According to Davis (1992), since two experts were used, a CVI value of at least 0.8 must be achieved. Since both experts were in agreement regarding the fact that all items were deemed to be either quite relative or highly relative to the domain, it can be established that I-CVI, S-CVI/Ave and S-CVI/UA met a sufficient level of 1 each, thereby concluding that the research tool has reached a satisfactory degree of content validity. The full calculation carried out to determine the aforementioned values are illustrated in Appendix D.

One of the experts also provided suggestions regarding how the wording of the description of Domain 3 as well as that of Question 29 in Domain 4 may be amended in order to be more accurately understood by the participants. The former was modified to provide an explanation regarding the phrase “social pressure that oncology nurses perceive to have”, so as to establish that this entails that nurses may feel pressured into doing non-nursing duties as perceived by them. The latter question was altered to read “The decision as to whether a nutritional assessment needs to be done should not be a standard practice but should take place only based upon my professional judgement”. Wording the question in this matter may aid in

ensuring that the participants' perceived behavioural control is truly being investigated.

3.8 Pilot study

According to Connelly (2008), the sample size of a pilot study should include 10% of the study sample. However, van Belle (2002) suggested that 12 participants should be used. Since 10% of the whole sample would have resulted in only 9 participants, 12 participants were chosen instead. This is because it cannot be guaranteed that all the chosen participants will choose to participate. Eleven of these participants consented towards participating in this pilot study, meaning that a 91.67% response rate was attained. The intermediary consulted with the wards' nursing officer to determine who may participate based on the provided eligibility criteria. The chosen participants were provided with an information letter and well as an invitation e-mail to the study.

The conduction of a pilot study was necessary for a multitude of reasons. Firstly, the measurement tool needed to be tested for reliability and validity, as detailed in Section 3.7. With regards to the conduction of the test-retest reliability for internal consistency, the chosen participants were provided with a code by the intermediary in order to allow the researcher to compare the answers provided by the same nurse at both instances while still ensuring their anonymity.

3.8 Ethical considerations

Following the acceptance of the research proposal and prior to the conduction of this research study, the researcher had to gain multiple permissions These included institutional permission from Mater Dei's Chief Executive Officer (Appendix E), the Data Protection Officer (Appendix F), and the Director of Nursing Services (Appendix G), as well as permission from the Senior Nursing Manager at SAMOC (Appendix H), the Oncology Clinical Chairperson (Appendix I), and the Quality Assurance Manager (Appendix I). Once all the aforementioned permissions were obtained from these hospital entities, ethical permission was also granted by the Faculty of Health Sciences Research Ethics Committee (FREC) (Appendix J) and University of Malta Research Ethics Committee (UREC) (Appendix K).

The principle of beneficence is assured in this research study due to the fact that the participants were not exposed to any instances where any harm, whether it be physical, affective, social or financial could have occurred (Polit & Beck, 2010). Furthermore, encompassing beneficence suggests that their participation does not lead to the participants being in a disadvantaged position due to exploitation (Polit & Beck, 2010). This was safeguarded through the protection of the participants' anonymity and confidentiality (Heale & Shorten, 2017). The participants were informed through an information e-mail prior to the conduction of the study that their responses will remain anonymous and that the survey answers could not be traced back to them. Moreover, the researcher did not encompass the contact details of the participants since an intermediary was used to disseminate the survey, further assuring confidentiality. The researcher also assured the participants that the acquired

information was used solely for the purpose of the research study, and that all data will be discarded upon completion of the study.

The ethical principle of assuring one's dignity was also enforced since participants had the right to determine for themselves whether they wish to take part in the study without fear of receiving biased treatment in return (Polit & Beck, 2010). This fact was disclosed in the information e-mail whereby participants were also informed that they may choose to withdraw from the study at any point in time. Moreover, obtaining informed consent highlights that the participants have a full understanding regarding what the research entails, that they comprehend the provided information, and that they encompass the right to decline participating in the study (Polit & Beck, 2010). The e-mail sent to the participants established that by clicking on the provided link that will redirect them to the survey, the participants would have consented to their participation in the study, while still allowing them to withdraw from the study whenever they wish to do so. All the aforementioned ethical principles were also applied to the pilot study.

3.10 Data collection

The dissemination of the survey was conducted by the aforementioned intermediary appointed prior to conducting the study, whereby an introductory information e-mail (Appendix L) which contained a description of what the study entailed as well as a link to the online survey was sent to all participants. When the participant clicked on the provided link, they were redirected to the survey, which was constructed using the SurveyMonkey® platform. A reminder e-mail was also sent by the intermediary one week following the previous e-mail in order to increase

the response rate (Manzo & Burke, 2012). The use of SurveyMonkey® is advantageous in the generation of a survey as results are automatically generated as statistical or graphical data, thereby allowing for data compilation to occur in a quick and effective manner.

3.11 Data analysis

Data analysis ensued in the form of statistical analysis due to the quantitative nature of the study which was conducted through Statistical Package for Social Sciences (SPSS) v.27. Descriptive analysis was also undertaken so as to adequately provide an explanation regarding the synthesis of the obtained data (Polit & Beck, 2010). Once all the completed questionnaires were collected, the data was transferred from SurveyMonkey® to SPSS. In order to ensure data protection, the data stored online was protected by a user name and password which was known solely by the researcher. Statistical analysis ensued through the guidance of an expert statistician.

Descriptive statistics including frequencies, percentages, means and SDs were presented for the socio-demographic characteristics and constructs regarding the oncology nurses' intentions, attitudes, knowledge, beliefs and perceived barriers towards the nutritional management and promotion of PA to oncology patients. These descriptive statistics were also applied to the section pertaining to the oncology nurses willingness to learn to enhance the target behaviours, and to the suggested educational interventions to be employed. Chi-square tests were applied in order to test for associations between socio-demographic factors.

The mean of the scores for each domain were calculated as explained in Section 3.3.4. The Shapiro-Wilk test of normality was conducted so as to determine whether

the constructs are normally distributed. The results are illustrated in Table 8. The data regarding the intention construct of the nutritional management of oncology patients, and the intention, attitude, knowledge and beliefs constructs of the promotion of PA to oncology patients was not normally distributed, as established through the attainment of a significant p value. Therefore, non-parametric tests were applied. When tests for associations between either of the aforementioned constructs to the gender variable were conducted, Mann-Whitney U tests were applied, while Kruskal-Wallis tests were applied between the aforementioned constructs and the rest of the socio-demographic variables.

Contrastingly, the data concerning the attitude, knowledge, beliefs and barriers constructs pertaining to the nutritional management of oncology patients, as well as the data concerning the perceived barriers towards the promotion of PA was normally distributed, as evident by the p value which was greater than 0.05. Therefore, parametric tests were applied. When tests for associations between either of the aforementioned constructs to the gender variable were conducted, Independent-Samples T tests were applied, whereas tests for associations between the aforementioned constructs to the rest of the socio-demographic variables were conducted, One-Way ANOVA tests were applied.

Independent T tests and Mann Whitney U tests were further applied to investigate the associations between the chosen educational interventions and the constructs. Missing data was minimal and reported where applicable. Statistical significance was established at $p < 0.05$ for all analyses except where specified in post hoc analysis.

	Shapiro-Wilk		
	Statistic	df	Sig.
Intention (N)	.809	61	.000*
Attitude (N)	.949	61	.013
Knowledge (N)	.951	61	.017
Beliefs (N)	.977	61	.315
Barriers (N)	.971	61	.149
Intention (PA)	.650	61	.000*
Attitude (PA)	.885	61	.000*
Knowledge (PA)	.941	61	.005*
Beliefs (PA)	.925	61	.001*
Barriers (PA)	.962	61	.055

Table 8. Shapiro-Wilk normality test

(n) - nutritional management

3.12 Conclusion

This chapter conferred the aims and objectives set out by the research question, which aided in determining that a quantitative approach adopting a cross-sectional survey design would be the most appropriate research design. Eligibility criteria were established and participants were recruited accordingly. The content of the research instrument as well as its reliability and validity were tested through the conduction of a pilot study. The method of data collection and the statistical analysis to be employed to the data were discussed. The following chapter entails a complete description of the obtained findings as directed by the objectives of the study.

Chapter 4: Results

Chapter 4: Results

4.1 Introduction

This chapter aims to present the findings of the study attained through the online survey distributed to the oncology nurses. Details regarding the study participants are provided, as well as the means and standard deviations (SD) of each question pertaining to each construct present in this study. The findings of tests for associations between socio-demographic characteristics and the constructs are also established. Finally, tests for associations between the oncology nurses' choice of educational intervention and the constructs were also conducted.

4.2 Response rate and characteristics of the participants

A total of 80 oncology nurses currently working at SAMOC were invited to participate in this study. 64 of these oncology nurses responded to the survey, meaning that a 80% response rate was obtained. Since no local research regarding the population was conducted prior to this study, comparisons could not be made. Therefore, the characteristics of the study participants were compared to those from previously conducted international studies so as to ensure that the study sample was representative of populations of oncology nurses.

4.2.1 Age and gender of the participants

The participants' age group ranged from 20 to over 60 years old. The majority of the respondents were between 20-30 years old (28.6%, n=18), while the least amount of respondents were found in the over 60 age group (7.9%, n=5). Further details are found in Table 9. Moreover, the vast majority of the participants were females (71.9%, n= 46), as only 28.1%, that is 18 of the participants were males.

Age Group	Frequency	Percentage
20-30	18	28.6%
31-40	15	23.8%
41-50	9	14.3%
51-60	16	25.4%
60+	5	7.9%
Total	63	100%

Table 9. Participants' age groups

4.2.1 Participants' grade and place of work within the oncology setting

The participants mainly consisted of staff nurses (47.6%, n=30), while only one deputy charge nurse (1.6%) and one enrolled nurse (1.6%) participated in this study. Table 10 establishes the frequencies and percentages of all the study participants. There was a significant relationship between the nurses' age and their role within the oncology setting ($\chi 2(20) = 50.116$, $p = 0.000$). Staff nurses were younger than senior staff nurses, deputy charge nurses and charge nurses.

Grade	Frequency	Percentage
Staff nurse	30	47.6%
Senior staff nurse	19	30.2%
Deputy charge nurse	1	1.6%
Charge nurse	4	6.3%
Practice nurse/nurse navigators	8	12.7%
Enrolled nurse	1	1.6%
Total	63	100%

Table 10. Participants' nursing grade

Most participants worked within inpatient wards (58.7%, n=37), while only three of the participants worked within the outpatients department (4.8%). The total number of participants in each work setting are presented in Table 11. There was a highly statistically significant relationship between the nurses' role within the oncology setting and their place of work ($\chi 2(15)=58.699$, $p=0.000$).

Place of work	Frequency	Percentage
Outpatients department	3	4.8%
Inpatient wards	37	58.7%
Day care ward	14	22.2%
Cancer Care Pathways	9	14.3%
Total	63	100%

Table 11. Participants' place of work within the oncology setting

4.2.3 Participants' years of experience of working in the oncology setting

The majority of the participants had been working in the oncology setting between 6 and 10 years (28.6%, n=18), while only 5 participants (7.9%) encompassed between 16 to 20 years of experience in the oncology setting. Table 12 provides the frequencies and percentages of the number of participants in each range of years of experience.

Years of experience	**Frequency**	**Percentage**
Less than 1 year	8	12.7%
1-5 years	10	15.9%
6-10 years	18	28.6%
11-15 years	9	14.3%
16-20 years	5	7.9%
More than 20 years	13	20.6%
Total	63	100%

Table 12. Participants' years of experience within the oncology setting

There was a highly significant relationship between the nurses' years of experience in the oncology setting and the role they fulfilled within the oncology setting ($\chi 2(25) = 46.500$, $p = 0.006$). Staff nurses were more likely to encompass between less than 1 year to 11 to 15 years of experience in the oncology setting, while senior staff nurses overall encompassed a greater amount of years in experience, ranging predominantly from 6 to 10 years up to more than 20 years of experience in the oncology setting. Charge nurses were associated with encompassing a greater number of years of experience, while practice nurses were

associated with having an average number of years of experience of between 6 to 10 years.

4.2.4 Participants' level of education

The majority of the participants held a degree in nursing (46.0%, n=29) while only nine of the participants (14.3%) held a masters degree in nursing. None of the participants held a doctorate in nursing. All relevant data to the participants' level of education is illustrated in Table 13.

Level of education	Frequency	Percentage
Diploma	24	38.1%
Degree	29	46.0%
Masters degree	9	14.3%
Doctorate	0	0%
Missing data	1	1.6%
Total	62	100%

Table 13. Participants' level of education

A highly significant relationship was present between the oncology nurses' level of education and their role in the oncology setting ($\chi 2(10) = 40.735$, $p = 0.000$), whereby staff nurses were associated with encompassing a degree, senior staff nurses possessed a diploma, while practice nurses were associated with having obtained a masters degree.

4.2.5 Participants' timing of patient contact

The majority of participants cared for oncology patients while they were receiving active treatment and for follow ups once they have completed their treatment (44.4%, n=28). 27% of the participants (n=17) were in contact with patients throughout the latter's entire cancer trajectory, suggesting that there potentially should have been ample opportunities to ensure nutritional management and to promote PA to their patients. Neither of the participants were in contact with patients only once the latter would have completed their treatment.

Timing of patient contact	Frequency	Percentage
The whole trajectory	17	27.00%
During diagnosis and treatment	5	7.9%
Only during treatment	12	19.0%
During treatment and aftercare	28	44.4%
Only after treatment	0	0.00%
Missing data	1	1.6%
Total	63	100%

Table 14. Participant's timing of patient contact

There is a significant relationship between the timing of patient contact and the nurses' role within the oncology setting ($\chi 2(15) = 26.828$, $p = 0.030$). Staff nurses and charge nurses were mostly in contact with patients while these were receiving their treatment and during their aftercare, while senior staff nurses and practice

nurses were more likely to be in contact with patients throughout their whole trajectory.

Furthermore, there is a highly significant relationship between the timing of patient contact and the place of work within the oncology setting ($\chi 2(9) = 58.450$, $p = 0.000$). Nurses who worked in inpatient wards tended to be in contact with their patients while these were receiving their treatment during their aftercare. However, nurses who worked in the outpatients department were mostly present during the point in the patients' trajectory where they would have received their diagnosis and would have begun to receive their required treatment. Moreover, nurses who worked in the Day Care Ward were mostly in contact with patients only while the latter were receiving their required treatment. Lastly, practice nurses (also known as nurse navigators) working within the Cancer Care Pathways Directorate were the most likely to have contact with patients throughout their whole cancer pathway.

4.2.6 Participants' lifestyle habits and PA promotion behaviour

Table 15 illustrates the frequency of the participants' engagement in PA. It is evident that despite the majority of participants ascertaining that they engage in PA between 1-2 times per week (54%, n=34), 19% (n=12) of the participants admitted that they do not engage in PA at all. Furthermore, only three participants (4.8%) stated that they exercise five or more times per week.

Frequency of engagement in PA	Frequency	Percentage
Never	12	19.0%
1-2 times per week	34	54.0%
3-4 times per week	14	22.2%
5 or more times per week	3	4.8%
Total	64	100%

Table 15. Participants' frequency of own engagement in PA

With regards to their PA promotion behaviours, the majority of the participants claimed that they sometimes tend to promote PA to their patients (57.14%, n=36). Moreover, while none of the participants stated that they advise their patients against engaging in PA, 3 of the participants established that they never promote PA to their patients (4.76%). Table 16 discloses the frequency of the participants' PA promotion behaviours.

Frequency of PA promotion to patients	Frequency	Percentage
Always	19	30.2%
Sometimes	36	57.1%
Rarely	5	7.9%
Never	3	4.8%
I advise against PA	0	0%
Total	63	100%

Table 16. Participants' frequency of PA promotion to their patients

There was a significant relationship between the nurses' role in the oncology setting and the frequency of PA promotion to oncology patients ($\chi2(15) = 30.972$, $p = 0.009$), as senior staff nurses and practice nurses were more likely to always promote PA to their patients than nurses who encompassed other grades.

However, there was no significant relationship between the frequency of PA promotion to oncology patients to the nurses' years of experience in the oncology setting ($\chi2(15) = 15.76$, $p = 0.396$), their level of education ($\chi2(6) = 10.094$, $p = 0.121$), their place of work within the oncology setting ($\chi2(9) = 16.675$, $p = 0.054$), their timing of patient contact ($\chi2(9) = 9.624p = 0.382$), their age ($\chi2(12) = 17.721$, $p = 0.124$), their gender ($\chi2(3) = 2.446$, $p = 0.485$), and their own frequency in engagement in PA ($\chi2(9) = 9.523$, $p = 0.390$).

4.3 Descriptive analysis of each construct pertaining to the nutritional management and promotion of PA in oncology patients

In this section, descriptive statistics comprising of frequencies, means (M) and SD of each construct, that is, the oncology nurses' intention, attitudes, knowledge, beliefs and perceived barriers towards both nutritional management and the promotion of PA, are presented.

4.3.1 Generalised intention

4.3.1.1 Generalised intention towards nutritional management

It may be determined that oncology nurses mostly encompass the intention of having the appropriate knowledge regarding nutritional management (M=4.41,

SD=0.663), and that they possess the motive and the desire of developing their knowledge regarding the nutritional management of their patients (M=4.29, SD=0.685). Lastly, they acknowledge their expectations regarding being knowledgeable regarding their patients' nutritional needs (M=4.14, SD=0.669). However, the wide range of responses suggests that some nurses also strongly disagree and disagree with the aforementioned intentions.

Item number		N	Minimum	Maximum	Mean	Std. Deviation
10	I am expected to be knowledgeable regarding the nutritional needs of my patient	63	1	5	4.14	.669
11	I want to be knowledgeable regarding the nutritional care that I should be providing to my patients	63	1	5	4.41	.663
12	I intend to improve my knowledge regarding the nutritional care that my patients require	63	1	5	4.29	.658
	Valid N (listwise)	63				

Table 17. Descriptive statistics for the generalised intention construct (nutritional management)

4.3.1.2 Generalised intention towards the promotion of PA

Generally, the oncology nurses in the sample agree that they possess the intention of discussing the pertinence of PA with their patients (M=4.11, SD=0.444), and of gaining knowledge concerning the most suitable PA for their patients to undergo (M=4.08, SD=0.451). The range of responses illustrates that neither of the nurses strongly disagreed or disagreed with the possession of these intentions.

Item number		N	Minimum	Maximum	Mean	Std. Deviation
37	I intend to increase my abilities and knowledge regarding the promotion of the most appropriate type of physical activity to my patients	63	3	5	4.08	0.451
38	I intend to discuss the importance of physical activity with my patients	63	3	5	4.11	0.444
	Valid N (listwise)	63				

Table 18. Descriptive statistics for the generalised intention construct (promotion of PA)

4.3.2 Oncology nurses' attitudes towards the target behaviours

4.3.2.1 Attitudes towards the nutritional management of oncology patients

As described in Chapter 3, Section 3.4, an equation was applied in order to attain an attitude score for this construct. The oncology nurses mostly agreed that nutritional management aids to enhance their patients' HRQoL and nutritional status (M=4.32, SD=0.591). Furthermore, while a high mean was attained for item 13 (M=4.13, SD=0.919), there was a large range of responses, as seen by the minimum and maximum responses of this item. Therefore, while some nurses strongly agreed that a basic component of nurses includes monitoring a patient's nutritional status, others strongly disagreed with this statement. However, greater importance was bestowed upon this concept in item 16, which is associated with item 13, as seen by

the higher mean attained and a decrease in the range of responses, with ‘somewhat important’ being the lowest attained response (M=1.05, SD=0.705).

Item number		N	Minimum	Maximum	Mean	Std. Deviation
13	Monitoring a patient's nutritional status is a basic component of nursing care.	63	1	5	4.16	.919
14	Patients should undergo repeated nutritional assessment every week of hospitalisation, or every treatment appointment.	63	2	5	3.97	.718
15	Nutritional assessment and management by nurses improves the patient's health related quality of life and nutritional status	63	3	5	4.32	.591
16	Ensuring that monitoring of the patient’s nutritional status is satisfactory is:	63	0	2	1.05	.705
17	Conducting repeated nutritional assessments is:	63	0	2	.97	.695
18	Ensuring that patients are experiencing the highest possible health related quality of life throughout the whole trajectory is:	63	0	2	1.24	.712
	Valid N (listwise)	63				

Table 19. Descriptive statistics for the attitudes construct (nutritional management)

4.3.2.2 Attitudes towards the promotion of PA to oncology patients

It may be concluded that the majority of the nurses deemed the referral of patients to other members of the multidisciplinary team who may aid in promoting physical activity to be very important (M=4.08, SD=0.552). However, despite the high mean value obtained, the range of minimum and maximum responses suggests

that a number of nurses disagreed with carrying out this referral. A vast number of the sample also recognised the importance of encouraging their patients to engage in the appropriate PA (M=3.97, SD = 0.515) while receiving their required treatment (M=4.00, SD=0.516).

Item Number		N	Minimum	Maximum	Mean	Std. Deviation
39	As a nurse, the encouragement of oncology patients to participate in physical activity is	61	3	5	3.97	.515
40	The referral of patients to other members of the multidisciplinary team who may aid in promoting physical activity is:	62	2	5	4.08	.552
41	I think that patients believe that the incorporation of physical activity with regards to its effect on their physical health is:	62	2	5	3.48	.763
42	Performing the appropriate physical activity while undergoing active treatment is:	61	3	5	4.00	.516
43	Performing the appropriate physical activity after completing treatment is:	62	2	5	3.97	.572
	Valid N (listwise)	60				

Table 20. Descriptive statistics for the attitudes construct (promotion of PA)

4.3.3 Oncology nurses' knowledge regarding the target behaviour

4.3.3.1 Oncology nurses' knowledge regarding nutritional management

The mean obtained in item 19 suggests that on average, the nurses were knowledgeable regarding the fact that nutritional support should commence early in the patient's cancer trajectory (M=1.86, SD=0.618). However, the range in responses

illustrates that some nurses are not knowledgeable on the matter since they agreed to initiating nutritional support only once the patient's treatment has been completed. A large discrepancy was also attained in item 21, with the mean suggesting that nurses tended to neither agree nor disagree with the notion that dieticians should be responsible for nutritional support rather than nurses (M=3.40, SD=1.016). The high means attained in items 22 till item 25 suggest that on average, the nurses were knowledgeable regarding the matters discussed in these items.

Item number		N	Minimum	Maximum	Mean	Std. Deviation
19	Nurses should commence nutritional support only once treatment has been completed	63	1	4	1.86	.618
20	Patients should be weighed upon admission or upon initiating treatment	63	3	5	4.59	.528
21	Dieticians, rather than nurses, are responsible for nutritional support	62	1	5	3.40	1.016
22	Patients should be encouraged to eat smaller and more frequent portions rather than larger meals	62	3	5	4.35	.546
23	Patients should be encouraged to consume foods which provide them with high levels of energy and that contain levels of protein	63	2	5	4.21	.722
24	A nutritional regime should be set up for patients at a higher risk of having a compromised nutritional intake	63	4	5	4.51	.504

25	In the case of hospitalised patients, a nutritional care plan should be provided to the patient upon discharge	63	1	5	4.06	.859
	Valid N (listwise)	61				

Table 21. Descriptive statistics for the knowledge construct (nutritional management)

4.3.3.2 Oncology nurses' knowledge regarding the promotion of PA

The mean scores attained suggest that on average, the nurses were knowledgeable regarding the effects of PA on oncology patients. However, a large range of responses were observed in all items, implying that some nurses do not possess the necessary knowledge regarding the benefits of PA to oncology patients. Moreover, the low mean score attained in Item 47 (M=2.74, SD=0.911) indicates that on average, the nurses are not aware of the fact that the engagement of oncology patients in the appropriate PA may result in a decrease in the risk of cancer recurrence.

Item number		N	Minimum	Maximum	Mean	Std. Deviation
44	Patients who perform physical activity will experience a greater amount of cancer-related pain	61	1	4	2.39	.862
45	Patients who perform physical activity are at a greater risk of experiencing cancer-related fatigue	61	1	4	2.57	.846
46	Patients who undergo physical activity will experience an improvement in their mental health and ability to perform activities of daily living	61	3	5	4.18	.671
47	Patients who undergo physical activity will experience a decreased risk of cancer recurrence	61	1	5	2.74	.911
48	Performing physical activity has no benefits whatsoever to oncology patients	61	1	5	1.84	.898
	Valid N (listwise)	61				

Table 22. Descriptive statistics for the knowledge construct (promotion of PA)

4.3.4 Oncology nurses' beliefs regarding the target behaviour

4.3.4.1 Oncology nurses' beliefs regarding nutritional management

On average, the oncology nurses seem to neither agree nor disagree with the fact that they encompass the confidence both in the knowledge that they possessed regarding the appropriate use of nutritional screening tools (M=3.44, SD=0.778), and in their capabilities pertaining to provide the adequate nutritional care to their patients (M=3.49, SD=0.821). However, these nurses perceive themselves as being more confident in their capabilities to liaise with the appropriate members of the multidisciplinary team as required for their patients (M=4.33, SD=0.475). Notwithstanding this, the nurses do not regard themselves to be in control as to

whether a nutritional assessment ultimately occurs (M=2.33, SD=0.898) and whether the referral of a particular patient to a dietician ensues (M=2.38, SD=0.906).

4.3.4.2 Oncology nurses' beliefs regarding the promotion of PA

The oncology nurses mostly neither agreed nor disagreed with the fact that they are confident in their knowledge pertaining to the current guidelines regarding PA promotion in oncology patients (M=3.13, SD=0.885). Furthermore, on average, these nurses did not believe that they encompass the ability to solely make the decision regarding whether their patient requires a referral to a physiotherapist (M=2.16, SD=0.637).

4.3.5 Oncology nurses' perceived barriers towards performing the target behaviour

4.3.5.1 Oncology nurses' perceived barriers towards nutritional management

The oncology nurses perceived the fact that nurses are not as well informed regarding their patients' nutritional needs as a result of lack of formal training during the undergraduate nursing programme as the ultimate barrier towards the appropriate nutritional management of oncology patients (M=3.60, SD=0.877). Moreover, the nurses also regarded the lack of current guidelines pertaining the decision as to which patients require undergoing a nutritional assessment, and how to develop a suitable nutritional nursing care plan as a substantial barrier which they currently encounter (M=3.59, SD=0.873). However, the nurses identified the lack of collaboration between members of the multidisciplinary team as the least concerning barrier to the nutritional management of their patients (M=2.65, SD=0.901).

Item Number		N	Minimum	Maximum	Mean	Std. Deviation
31	Too much time elapses from when a patient who requires nutritional intervention is identified to formulating a nutritional care plan or regime	63	2	5	3.49	.896
32	Lack of protocols and guidelines are currently available to determine which patients require undergoing nutritional assessment and that aid in formulating an appropriate nutritional care plan	63	2	5	3.59	.873
33	Nurses have deficient knowledge regarding oncology patients' nutritional needs due to lack of training during the undergraduate programe	62	2	5	3.60	.877
34	Lack of availability of dietician services	63	1	5	3.06	1.105
35	Lack of collaboration between nurses, dieticians, doctors and other multidisciplinary team members	63	1	5	2.65	.901
	Valid N (listwise)	62				

Table 23. Descriptive statistics for the barriers construct (nutritional management)

4.3.5.2 Oncology nurses' perceived barriers towards the promotion of PA

The lack of prior guidance and education regarding the most appropriate method of integrating PA in the care of oncology patients was also identified as the greatest barrier that oncology nurses perceive to possess with respect to the promotion of PA to their patients (M=3.54, SD=0.886). Another significant barrier that the nurses established is that of the lack of availability of guidelines to adhere to which would in turn instruct them on how to appropriately determine what PA is safe for particular

patients to perform (M=3.46, SD=0.905). The oncology nurses were the least troubled by the barrier concerning having the impression that they are not to be held responsible for the promotion of PA to their patients (M=2.28, SD=0.839).

Item Number		N	Minimum	Maximum	Mean	Std. Deviation
51	Lack of time available to spend with the patient o discuss physical activity	60	1	5	2.92	1.046
52	Lack of knowledge regarding how to incorporate physical activity in the care of oncology patients due to lack of prior training	61	2	5	3.54	.886
53	Lack of guidelines to follow with regards to which patients should undergo which type of physical activity	61	2	5	3.46	.905
54	I feel that it is not my responsibility to promote physical activity to patients	61	1	4	2.28	.839
55	Patients with a poor diagnosis will not benefit from physical activity	61	1	4	2.41	.938
	Valid N (listwise)	60				

Table 24. Descriptive statistics for the barriers construct (promotion of PA)

4.4 Tests for associations between individual constructs and socio-demographic variables

In this section, the findings related to the associations of the intention, attitude, knowledge, beliefs and perceived barriers constructs for both the nutritional management and the promotion of PA with the socio-demographics are presented.

4.4.1 Gender

As illustrated in Table 25, females tended to obtain a higher attitude score pertaining to promotion of PA to oncology patients (M=3.95, SD=0.401) when compared to males (M=3.89, SD=0.406), with a Mann-Whitney test demonstrating that this difference was statistically significant (U(Nfemale= 44, Nmale= 18) = 272.5, z = -1.977, p=0.046). No other significant associations were found to the attitude (t(61)=1.204, p=0.987), knowledge (t(61)=0.301, p=0.309), beliefs, (t(61)=1.443, p=0.508) and barriers pertaining to nutritional management (t(61)=0.844, p=0.455), as well as barriers to the promotion of PA (t(59)=0.852, p=0.794).

Construct	Gender	N	Mean	SD	Mann-Whitney U	P value
Construct	Female	45	4.338	0.6767	305.5	0.106
	Male	18	4.133	0.5213		
Intention (N)	Female	45	4.133	0.4573	328.5	0.127
	Male	18	3.944	0.4162		
Intention (PA)	Female	44	3.950	0.4010	272.5	0.046*
	Male	18	3.890	0.4060		
Attitude (PA)	Female	43	2.800	0.3740	340.0	0.450
	Male	18	2.700	0.3900		
Knowledge (PA)	Female	43	2.670	0.6720	402.0	0.806
	Male	18	2.720	0.4920		

Table 25. Findings of Mann-Whitney U tests for associations between gender and constructs with non-normally distributed data

4.4.2 Age groups

A Kruskal-Wallis test demonstrated statistical significance between the nurses' age group and their knowledge pertaining to the promotion of PA to their patients ($\chi 2(4) = 11.337$, p=0.023). Pairwise comparisons of age were then conducted for this construct which revealed that the nurses who were part of the 31-40 age group were more knowledgeable regarding the promotion of PA than those nurses who were in the 51-60 age group (z=20.267, p=0.015). The findings of the one-way ANOVA test suggest that no significant differences between the attitude (F(4)=0.773, p=0.547), knowledge (F(4)=1.589, p=0.189), beliefs (F(4)=0.976, p=0.428) and barriers (F(4)=1.006, p=0.412) constructs pertaining to nutritional management as well as the barriers to PA promotion (F(4)=1.929, p=0.109), and the oncology nurses' age groups were found.

4.4.3 Level of education

Both the Kruskal-Wallis tests for association and the one-way ANOVA tests did not yield any significant results regarding the effect of the oncology nurses' level of education to the nurses' intention, attitude, beliefs and perceived barriers towards the nutritional management and promotion of PA, as shown in Tables 26 and 27, respectively.

Construct	N	Mean	SD	Kruskal-Wallis (χ2)	df	P value
Intention (N)	62	4.286	0.637	0.113	2	0.945
Intention (PA)	62	4.089	0.448	2.423	2	0.298
Attitude (PA)	61	3.910	0.390	2.422	2	0.298
Knowledge (PA)	60	2.780	0.379	3.020	2	0.221
Beliefs (PA)	60	2.690	0.625	2.502	2	0.286

Table 26. Findings of Kruskal-Wallis tests for associations between level of education and constructs with non-normally distributed data

		Sum of Squares	df	Mean Square	F	Sig.
Attitude (N)	Between Groups	233.577	2	116.788	1.434	0.246
	Within Groups	4804.165	59	81.427		
	Total	5037.742	61			
Knowledge (N)	Between Groups	0.572	2	0.286	03.033	0.056
	Within Groups	5.562	59	0.094		
	Total	6.134	61			
PBC (N)	Between Groups	0.089	2	0.044	0.163	0.850
	Within Groups	16.059	59	0.272		
	Total	16.148	61			
Barriers (N)	Between Groups	0.199	2	0.099	0.238	0.789
	Within Groups	24.625	59	0.417		
	Total	24.823	61			
Barriers (P)	Between Groups	0.066	2	0.033	0.097	0.907
	Within Groups	19.344	57	0.339		
	Total	19.410	59			

Table 27. Findings of ANOVA one-way tests for associations between level of education and constructs with normally distributed data

4.4.4 Years of experience in the oncology setting

As illustrated in Table 28, a significant relationship is present, as determined by one-way ANOVA, between the oncology nurses' years of experience and their perceived barriers towards nutritional management of oncology patients (F(5)=2.531, p=0.039) and their perceived barriers towards the promotion of PA to oncology patients (F(5)=6.852, p=0.000). The Kruskal-Wallis tests, however, did not yield any significant results pertaining to the association between the oncology nurses' years of experience to their intention regarding nutritional management (χ2(5)=5.791, p=0.327), and their intention (χ2(5)=3.433, p=0.634), attitudes (χ2(5)=2.029, p=0.845), knowledge (χ2(5)=10.183, p=0.070) and beliefs (χ2(5)=7.929, p=0.160) regarding promotion of PA to their patients.

		Sum of Squares	df	Mean Square	F	Sig.
Attitude (N)	Between Groups	728.943	5	145.789	1.823	0.123
	Within Groups	4558.708	57	79.977		
	Total	5287.651	62			
Knowledge (N)	Between Groups	0.727	5	0.145	1.526	0.196
	Within Groups	5.430	57	0.095		
	Total	6.157	62			
PBC (N)	Between Groups	2.261	5	0.452	1.838	0.120
	Within Groups	14.022	57	0.246		
	Total	16.283	62			
Barriers (N)	Between Groups	4.530	5	0.906	2.531	0.039*
	Within Groups	20.405	57	0.358		
	Total	24.936	62			
Barriers (PA)	Between Groups	7.456	5	1.491	6.852	0.000*
	Within Groups	11.971	55	0.218		
	Total	19.427	60			

Table 28. Findings of ANOVA one-way tests for associations between years of experience and constructs with normally distributed data

The Bonferroni correction was carried out as a post hoc test, through the division of the original p value of 0.05 by the number of comparisons being employed due to an enhanced probability of type 1 error (Armstrong, 2014).The post hoc analysis revealed that those nurses who had less than one year of experience reported a greater score, therefore a higher degree of agreement towards the barriers presented, than those who had between 11-15 years of experience (M difference =0.789, SD=0.227, p=0.012). Moreover, those nurses with between 1-5 years of experience in the oncology setting reported a higher mean than those with between 6-10 years of experience (M difference=0.791, SD=0.186, p=0.001), those between 11-15 years of experience (M difference=1.009, SD=0.214, p=0.000) and those with more than 20 years of experience (M difference=0.795, SD=0.200, p=0.003).

Dependent Variable	(I) Years of experience of working in the oncology setting:	(J) Years of experience of working in the oncology setting:	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
		16-20 years	.2738	.3149	.952	-.655	1.202
Barriers (PA)	Less than 1 year	1-5 years	-.220	.221	.918	-.87	.43
		6-10 years	.571	.200	.064	-.02	1.16
		11-15 years	.789*	.227	.012*	.12	1.46
		16-20 years	.220	.266	.961	-.57	1.01
		More than 20 years	.575	.213	.091	-.05	1.20
	1-5 years	Less than 1 year	.220	.221	.918	-.43	.87
		6-10 years	.791*	.186	.001*	.24	1.34
		11-15 years	1.009*	.214	.000*	.38	1.64
		16-20 years	.440	.256	.524	-.31	1.19
		More than 20 years	.795*	.200	.003*	.21	1.38
	6-10 years	Less than 1 year	-.571	.200	.064	-1.16	.02
		1-5 years	-.791*	.186	.001	-1.34	-.24
		11-15 years	.218	.192	.865	-.35	.79
		16-20 years	-.351	.237	.680	-1.05	.35
		More than 20 years	.004	.176	1.000	-.51	.52
	11-15 years	Less than 1 year	-.789*	.227	.012	-1.46	-.12
		1-5 years	-1.009*	.214	.000	-1.64	-.38
		6-10 years	-.218	.192	.865	-.79	.35
		16-20 years	-.569	.260	.261	-1.34	.20
		More than 20 years	-.214	.206	.902	-.82	.39
	16-20 years	Less than 1 year	-.220	.266	.961	-1.01	.57
		1-5 years	-.440	.256	.524	-1.19	.31
		6-10 years	.351	.237	.680	-.35	1.05
		11-15 years	.569	.260	.261	-.20	1.34
		More than 20 years	.355	.248	.709	-.38	1.09
	More than 20 years	Less than 1 year	-.575	.213	.091	-1.20	.05
		1-5 years	-.795*	.200	.003	-1.38	-.21
		6-10 years	-.004	.176	1.000	-.52	.51
		11-15 years	.214	.206	.902	-.39	.82
		16-20 years	-.355	.248	.709	-1.09	.38

*. The mean difference is significant at the 0.05 level.

Table 29. Post hoc analysis of years of experience to Barriers (N) and Barriers (PA) constructs

4.4.5 Role in the oncology setting

According to the Kruskal-Wallis test conducted, there was a significant difference between the oncology nurses' role in the oncology setting and their

intention ($\chi 2(5)=11.830$, p=0.037) as well as their beliefs pertaining to the promotion of PA to their patients ($\chi 2(5)=11.461$, p=0.043), as demonstrated in Table 30.

With regards to the nurses' beliefs , the pairwise comparisons carried out revealed that senior staff nurses attained higher means than staff nurses (z=11.770, p=0.019), charge nurses attained higher means than staff nurses (z=18.533, p=0.043), and practice nurses attained higher means than staff nurses (z=35.033, p=0.045). Moreover, the pairwise comparisons also showed that practice nurses attained higher means regarding their intention to promote PA than staff nurses (z=17.971, p=0.001) and senior staff nurses (z=17.845, p=0.002). There were no statistically significant results between group means as determined by one-way ANOVA for attitude (F(5)=0.651, p=0.662), knowledge (F(5)=1.444, p=0.223), beliefs (F(5)=0.086, p=0.906) and barriers pertaining to nutritional management (F(5)=1.354, p=0.255), as well as for barriers pertaining to PA promotion (F(5)=2.113, p=0.078).

Construct	N	Mean	SD	Kruskal-Wallis ($\chi 2$)	df	P value
Intention (N)	63	4.279	0.639	5.140	5	0.399
Intention (PA)	63	4.079	0.451	11.830	5	0.037*
Attitude (PA)	62	3.890	0.411	1.924	5	0.860
Knowledge (PA)	61	2.770	0.379	7.812	5	0.167
Beliefs (PA)	61	2.690	0.620	11.461	5	0.043*

Table 30. Findings of Kruskal-Wallis tests for associations between role in the oncology setting and constructs with non-normally distributed data

4.4.6 Place of work within the oncology setting

The Kruskal-Wallis test revealed that there is a significant association between the oncology nurses' place of work within the oncology setting to their intention regarding the promotion of PA ($\chi2(3)=16.364$, $p=0.001$). This association was not present for the oncology nurses' intention regarding their patients' nutritional management ($\chi2(3)=1.279$, $p=0.734$), and their attitude ($\chi2(3)=1.342$, $p=0.719$), knowledge ($\chi2(3)=2.262$, $p=0.520$) and beliefs regarding the promotion of PA to their patients ($\chi2(3)=4.865$, $p=0.182$). A pairwise comparison was carried out which demonstrated that nurse navigators practising within the Cancer Care Pathway had a higher intention score than nurses who work within the Inpatient wards ($z=-20.853$, $p=0.000$), those who work within the outpatients department ($z=19.556$, 0.036), and those who work within the Day Care Ward ($z=-15.198$, $p=0.011$).

Furthermore, the conduction of one-way ANOVA tests resulted in the attainment of statistically significant differences between groups in the nurses' attitudes pertaining to the nutritional management of their patients ($F(3, 59) = 4.000$, $p=0.012$) and in the nurses' perceived barriers towards the promotion of PA to their patients ($F(3, 57)=7.194$, $p=0.000$), as demonstrated in Table 31.

		Sum of Squares	df	Mean Square	F	Sig.
Attitude (N)	Between Groups	893.753	3	297.918	4.000	.012 *
	Within Groups	4393.898	59	74.473		
	Total	5287.651	62			
Knowledge (N)	Between Groups	.410	3	.137	1.402	.251
	Within Groups	5.747	59	.097		
	Total	6.157	62			
Beliefs (N)	Between Groups	.212	3	.071	.260	.854
	Within Groups	16.071	59	.272		
	Total	16.283	62			
Barriers (N)	Between Groups	1.436	3	.479	1.201	.317
	Within Groups	23.500	59	.398		
	Total	24.936	62			
Barriers (PA)	Between Groups	5.336	3	1.779	7.194	.000 *
	Within Groups	14.091	57	.247		
	Total	19.427	60			

Table 31. Findings of ANOVA one-way tests for associations between place of work within the oncology setting and constructs with normally distributed data

A post hoc analysis using the Bonferroni corrections for multiple comparisons was conducted and the p value was adjusted to $p \leq 0.016$. The results of this analysis are presented in Table 32. Oncology nurses who worked in the Day Care Ward obtained higher scores in the construct pertaining to their perceived barriers towards the promotion of PA than those nurses who worked in inpatient wards (M difference=0.608, SD=0.156, p=0.002) and than practice nurses working within the Cancer Care Pathway (M difference=0.857, SD=0.230, p=0.003). This suggests that nurses who worked in the Day Care Ward perceived themselves to posses a greater degree of impediment towards effectively promoting PA to their patients. The analysis did not yield any statistically significant results for the construct regarding

the nurses' attitude towards nutritional management of their patients due to the strict p value obtained by the Bonferroni corrections method.

Dependent Variable	(I) Place of work within the oncology setting: Response	(J) Place of work within the oncology setting: Response	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
Barriers (PA)	Day care Ward	Inpatient wards	.608*	.156	.002*	.18	1.03
		Cancer Care Pathway	.857*	.230	.003*	.23	1.49
		Outpatients Department	.067	.316	1.000	-.80	.93
	Inpatient wards	Day care Ward	-.608*	.156	.002	-1.03	-.18
		Cancer Care Pathway	.249	.205	1.000	-.31	.81
		Outpatients Department	-.541	.298	.450	-1.36	.27
	Cancer Care Pathway	Day care Ward	-.857*	.230	.003	-1.49	-.23
		Inpatient wards	-.249	.205	1.000	-.81	.31
		Outpatients Department	-.790	.343	.149	-1.73	.15
	Outpatients Department	Day care Ward	-.067	.316	1.000	-.93	.80
		Inpatient wards	.541	.298	.450	-.27	1.36
		Cancer Care Pathway	.790	.343	.149	-.15	1.73
*. The mean difference is significant at the 0.05 level.							

Table 32. Post hoc analysis of the oncology nurses' place of work to the attiude (N) and barriers (N) construct

4.4.7 Timing of patient contact

As illustrated in Table 33, an one-way ANOVA test revealed that there is statistical significance between groups between the nurses' timing of patient contact to their attitude (F(3, 58)=2.961, p=0.04), beliefs (F(3, 58)=9.894, p=0.000), and perceived barriers towards the nutritional management of their patients (F(3,

58)=5.381, p=0.002), and to their perceived barriers towards the promotion of PA to their patients (F(3, 56)=9.510, p=0.000).

		Sum of Squares	df	Mean Square	F	Sig.
Attitude (N)	Between Groups	676.963	3	225.654	2.961	.040*
	Within Groups	4420.456	58	76.215		
	Total	5097.419	61			
Knowledge (N)	Between Groups	.507	3	.169	1.742	.168
	Within Groups	5.628	58	.097		
	Total	6.135	61			
Beliefs (N)	Between Groups	5.493	3	1.831	9.894	.000*
	Within Groups	10.734	58	.185		
	Total	16.227	61			
Barriers (N)	Between Groups	5.426	3	1.809	5.381	.002*
	Within Groups	19.492	58	.336		
	Total	24.918	61			
Barriers (PA)	Between Groups	6.481	3	2.160	9.510	.000*
	Within Groups	12.721	56	.227		
	Total	19.202	59			

Table 33. Findings of ANOVA one-way tests for associations between timing of patient contact and constructs with normally distributed data

A post hoc analysis using the Bonferroni corrections for multiple comparisons was conducted for the aforementioned statistically significant constructs, and the p value was adjusted to p≤0.017. With regards to the nurses' beliefs pertaining to nutritional management, those in contact with patients only while the latter were receiving their treatment obtained a higher mean than those in contact with patients receiving their treatment and during their aftercare (M difference=0.4905, SD=0.1484, p=0.010). Furthermore, the those in contact with their patients

throughout the entire trajectory attained a higher mean than those present while their patients were receiving treatment and aftercare (M difference=0.6807, SD=1.323, p=0.000).

The analysis of the perceived barriers pertaining to nutritional management revealed that the nurses in contact with patients only while these were receiving their treatment obtained a higher mean, suggesting that they identify themselves to encounter more barriers, than those who were present while their patients were receiving treatment and during aftercare (M difference=0.6613, SD=0.2, p=0.010). Moreover, those in contact with their patients throughout the whole trajectory obtained a higher mean than those who were in contact while their patients were receiving treatment and aftercare (M difference=0.5630, SD=0.1782, p=0.015).

With regards to the perceived barriers towards the promotion of PA, the analysis exhibited that those in contact with patients only while the latter were receiving treatment attained a higher mean than those who were present during their patients' treatment and aftercare (M difference=0.805, SD=0.164, p=0.000), and those who were in contact with their patients throughout their entire trajectory (M difference=0.690, SD=0.185, p=0.003). The analysis pertaining to the construct regarding the nurses' attitudes towards nutritional management of their patients did not yield any statistically significant results due to the strict p value enforced.

4.4.8 Frequency of the oncology nurses' engagement in PA

The results of the one-way ANOVA test carried out revealed that there is a statistically significant difference between groups between the frequency that oncology nurses engage in PA themselves and their attitude (F(3, 59)=10.656,

p=0.000), knowledge (F(3, 59)=5.487, p=0.002) and beliefs (F(3, 59)=3.989, p=0.012) pertaining to the nutritional management of their patients. The constructs regarding their perceived barriers towards nutritional management (F(3, 59)=1.091, p=0.360) and their perceived barriers towards the promotion of PA (F(, 3, 57)=0.369, p=0.757) did not reach statistical significance.

A post hoc analysis using the Bonferroni corrections for multiple comparisons was conducted for the statistically significant constructs, whereby the p value was adjusted to $p<0.017$. As illustrated in Table 34, with regards to the construct pertaining to the nurses' attitude towards the nutritional management of their patients, those who never engaged in PA themselves obtained a higher mean than those who exercised between 1-2 times per week (M difference=13.887, SD=2.56, p=0.000). Moreover, those who engaged in PA more than 5 times a week attained a higher mean in the construct pertaining to knowledge regarding oncology patients' nutritional management than those who engaged in PA between 1-2 times per week (M difference=0.6676, SD=0.172, p=0.002) and those who never engaged in PA (M difference=0.6750, SD=0.184, p=0.003). Neither of the comparisons made within the beliefs regarding nutritional management reached statistical significance due to the strict p value applied.

Dependent Variable	(I) How often do you personally engage in physical exercise?	(J) How often do you personally engage in physical exercise?	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
Attitude (N)	1-2 times per week	3-4 times per week	-7.0420*	2.4211	.031	-13.652	-.432
		5 or more times per week	-1.6373	4.5919	1.000	-14.174	10.899
		Never	-13.8873*	2.5600	.000	-20.876	-6.898
	3-4 times per week	1-2 times per week	7.0420*	2.4211	.031	.432	13.652
		5 or more times per week	5.4048	4.8505	1.000	-7.838	18.647
		Never	-6.8452	2.9993	.157	-15.034	1.343
	5 or more times per week	1-2 times per week	1.6373	4.5919	1.000	-10.899	14.174
		3-4 times per week	-5.4048	4.8505	1.000	-18.647	7.838
		Never	-12.2500	4.9213	.094	-25.686	1.186
	Never	1-2 times per week	13.8873*	2.5600	.000*	6.898	20.876
		3-4 times per week	6.8452	2.9993	.157	-1.343	15.034
		5 or more times per week	12.2500	4.9213	.094	-1.186	25.686
Knowledge (N)	1-2 times per week	3-4 times per week	.0466	.0907	1.000	-.201	.294
		5 or more times per week	-.6676*	.1720	.002	-1.137	-.198
		Never	.0074	.0959	1.000	-.255	.269
	3-4 times per week	1-2 times per week	-.0466	.0907	1.000	-.294	.201
		5 or more times per week	-.7143*	.1817	.001*	-1.210	-.218
		Never	-.0393	.1124	1.000	-.346	.268
	5 or more times per week	1-2 times per week	.6676*	.1720	.002*	.198	1.137
		3-4 times per week	.7143*	.1817	.001	.218	1.210
		Never	.6750*	.1844	.003*	.172	1.178
	Never	1-2 times per week	-.0074	.0959	1.000	-.269	.255
		3-4 times per week	.0393	.1124	1.000	-.268	.346
		5 or more times per week	-.6750*	.1844	.003	-1.178	-.172
*. The mean difference is significant at the 0.05 level.							

Table 34. Post hoc analysis of the oncology nurses' frequency of engagement in PA to the attitude (N) and knowledge (N) construct

Neither of the constructs reached statistical significance when Kruskal Wallis tests were conducted on the intention construct pertaining to the nutritional

management of oncology patients, and the intention (N) ($\chi2(3)=6.681$, $p=0.083$) and (PA) ($\chi2(3)=5.750$, $p=0.124$), attitude ($\chi2(3)=1.925$, $p=0.588$), knowledge ($\chi2(3)=1.294$, $p=0.731$) and beliefs ($\chi2(3)=1.662$, $p=0.646$) constructs pertaining to the promotion of PA to oncology patients.

4.4.9 Frequency of PA promotion to patients

From the one-way ANOVA test carried out it was determined that there was a statistically significant difference between groups between the frequency that oncology nurses promote PA to their patients and their attitude ($F(3, 59)=7.57$, $p=0.000$) and their perceived barriers towards the nutritional management of oncology patients ($F(3, 59)=3.349$, $p=0.025$).

Therefore, a post hoc analysis using the Bonferroni corrections for multiple comparisons was conducted for these constructs, and the p value was adjusted to $p\leq0.017$. As demonstrated in Table 35, the nurses who always promoted PA to their patients attained a higher attitude score pertaining to the nutritional management of oncology patients than those who only promoted PA sometimes (M difference=9.9518, SD=2.281, $p=0.001$). Moreover, those who always promoted PA to their patients obtained higher scores pertaining to the perceived barriers regarding nutritional management than those who only promoted PA sometimes (M difference=0.5319, SD=0.170, $p=0.017$). This suggests that the former group of nurses reported experienced more barriers towards conducting the target behaviour than the latter group of nurses.

Dependent Variable	(I) How often have you promoted physical activity to your patients in the last three months?	(J) How often have you promoted physical activity to your patients in the last three months?	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
Attitude (N)	Never	Rarely	8.8000	5.8748	.837	-7.239	24.839
		Sometimes	12.5833	4.8340	.070	-.614	25.781
		Always	2.6316	4.9976	1.000	-11.013	16.276
	Rarely	Never	-8.8000	5.8748	.837	-24.839	7.239
		Sometimes	3.7833	3.8392	1.000	-6.698	14.265
		Always	-6.1684	4.0433	.795	-17.207	4.870
	Sometimes	Never	-12.5833	4.8340	.070	-25.781	.614
		Rarely	-3.7833	3.8392	1.000	-14.265	6.698
		Always	-9.9518*	2.2811	.000	-16.179	-3.724
	Always	Never	-2.6316	4.9976	1.000	-16.276	11.013
		Rarely	6.1684	4.0433	.795	-4.870	17.207
		Sometimes	9.9518*	2.2811	.000*	3.724	16.179
Barriers (N)	Never	Rarely	.0400	.4389	1.000	-1.158	1.238
		Sometimes	.3319	.3611	1.000	-.654	1.318
		Always	-.2000	.3734	1.000	-1.219	.819
	Rarely	Never	-.0400	.4389	1.000	-1.238	1.158
		Sometimes	.2919	.2868	1.000	-.491	1.075
		Always	-.2400	.3021	1.000	-1.065	.585
	Sometimes	Never	-.3319	.3611	1.000	-1.318	.654
		Rarely	-.2919	.2868	1.000	-1.075	.491
		Always	-.5319*	.1704	.017	-.997	-.067
	Always	Never	.2000	.3734	1.000	-.819	1.219
		Rarely	.2400	.3021	1.000	-.585	1.065
		Sometimes	.5319*	.1704	.017*	.067	.997

*. The mean difference is significant at the 0.05 level.

Table 35. Post hoc analysis of the oncology nurses' frequency of PA promotion to patients to the attitude (N) and barriers (N) construct

4.5 Correlation between constructs

The correlation between all constructs was analysed in order to determine whether there is a relationship between the direction and the strength between

constructs. While most correlations were considered to be too weak, a positive moderate correlation (ρ=0.656) was only present between the intention and attitude constructs pertaining to the nutritional management of oncology patients. Therefore, the greater the intention that the oncology nurses have towards the nutritional management of their patients, the greater their attitude towards performing this target behaviour.

4.6 Oncology nurses' willingness to learn

The oncology nurses were asked whether they would be willing to partake in educational interventions aimed towards increasing their current knowledge regarding nutritional management and PA in oncology patients. 95.2% (n=60) of participants agreed to undergo these training sessions while 1.6% (n=1) of the participants disagreed. 3.2% (n=3) of the participants did not provide an answer to this questionnaire item.

Tests for associations were done so as to determine whether there is a statistically significant relationship between the constructs and the proposed methods of educational interventions to be enforced. By doing so, the likelihood of the nurses being willing to partake in these educational interventions and to increase the probability of the implementation of a successful learning experience is enhanced.

Web-based learning was the most favoured option amongst the participants, with 65.1% (n=41) having chosen this educational intervention. However, there was no statistical significance between this choice and the constructs. The construct regarding the nurses' attitude pertaining to the nutritional management of their patients, however, nearly reached statistical significance ($t(61)=1.992$, $p=0.051$).

The intervention pertaining to conducting a video conference was chosen by 35.4% (n=16) of the participants. However, neither of the statistical test applied yielded any statistically significant results for associations between the constructs and the choice of partaking in a video conference.

27% (n=17) of participants chose attending lectures as the training method that they would most likely participate in. There was a statistically significant difference between those who chose this and the knowledge construct pertaining to nutritional management ($t(61)=2.04$, $p=0.046$). Therefore, the nurses who obtained higher means in the aforementioned construct were more like to choose to attend lectures. No other statistically significant results were obtained through the Mann Whitney U test.

Only 15.9% (n=10) of participants established that they would favour partaking in a job shadowing experience. The conduction of independent T tests yielded a statistically significant result pertaining to the nurses' attitude ($t(61)=2.829$, $p=0.006$) and their beliefs ($t(61)=2.41$, $p=0.019$) regarding nutritional management when associated with participating in job shadowing. This suggests that nurses who attained higher means in these constructs were more likely to partake in this educational interventions.

Furthermore, a Mann Whitney U test revealed that there is statistical significance between the nurses' intention regarding nutritional management ($U(Nyes=10, Nno=53)=133.000$, $p=0.008$), and their intention ($U(Nyes=10, Nno=53)=178.500$, $p=0.033$) and their attitude ($U(Nyes=10, Nno=53)=159.000$, $p=0.044$) regarding the promotion of PA to their patients. Consequently, those nurses who achieved higher means in these constructs were more willing to choose to take part in job shadowing.

4.7 Conclusion

This chapter established the results obtained from the online survey distributed to the oncology nurses in fulfilment of the aims and objectives of this study. These results were presented as descriptive statistics and in table form. In the following chapter a comprehensive analysis of the results presented in this chapter, supported by the results of previously published studies, will ensue.

Chapter 5: Discussion

Chapter 5: Discussion

5.1 Introduction

This chapter aims to discuss the results of the research project to facilitate the understanding of the oncology nurses' attitudes, knowledge, beliefs and perceived barriers towards nutritional management and the promotion of PA to oncology patients in relation to previously published literature on the topic. This is the first study to examine the above among the local oncology nurses, thereby the discussion of these findings is essential in order to obtain a comprehensive and thorough understanding of the aforementioned constructs with reference to the local oncology nurses. Finally, the results are applied to the TPB, and the strengths and limitations of the study are considered.

5.2 Characteristics of study participants

The vast majority of participants in this study were females, which reflects the high female nurse ratios observed in previous studies (O'Hanlon & Kennedy, 2014; Puhringer et al., 2017; Keogh et al., 2017; Papier et al., 2017).

The sample was mostly comprised of oncology nurses aged between 20 and 30 years old, suggesting that the majority of local oncology nurses are younger in age. The reason for having a younger population of oncology nurses locally could be due to the fact that SAMOC was established in 2013, which in turn, could have increased the likelihood of newly graduated nurses to choose to work in this establishment as a result of an increase in vacancies for oncology nurses that this brought about.

Furthermore, younger nurses may be more computer literate, and therefore, this might have been a contributing factor as to why the highest rate of respondents to this online survey were younger than the rest of the nurses (Saleh & Bista, 2017).

Nearly half of the participants comprised mostly of staff nurses. Four charge nurses participated, meaning that only one charge nurse did not participate in this study. However, only one deputy charge nurse out of the five currently working at SAMOC partook in this study. Furthermore, all eight nurse navigators working in the Cancer Care Pathways Directorate at the time that the study was conducted, participated in the study. 58.7% of the nurses in the sample worked within inpatient wards.

With regards to the nurses' years of experience in the oncology setting, 28.6% of the participants had between 6 and 10 years of professional experience. This is similar to the sample in the study by Haussmann et al. (2018) where 59.6% of the participants had less than 15 years of experience, and to the study by vanVeen et al. (2017) where 22.9% of the participants encompassed between 6 and 15 years of experience in the oncology setting. However, all other aforementioned studies comprised of oncology nurses with a greater number of years of experience.

Since most of the participants in this study held a degree in nursing, it can be concluded that the majority of the nurses held a higher educational qualification than those in the studies by Puhringer et al. (2015) and Keogh et al. (2017), since most of the nurses in this sample held a diploma in nursing. This may be considered to be advantageous since education may influence the oncology nurses' knowledge that may be applied to their practice (McHugh & Lake, 2010). The significant relationship attained between the oncology nurses' level of education and their role in the oncology setting is appropriate due to the fact that due to the specialised nature

of the nurse navigator role, a Masters degree with a specialisation in oncology nursing is necessary in order to be eligible for the role.

The majority of the participants were in contact with patients while these were receiving their required treatment and during aftercare. This is advantageous because nurses are able to build a therapeutic relationship with their patients. Therefore, this provides the nurses with ample opportunities to discuss the importance of nutrition and PA to their patients (Kapucu, 2016).

The majority of the participants only engaged in PA 1-2 times per week, while most of the participants in the studies by Puhringer et al. (2015) and Keough et al. (2017) exercised more than five times per week. This may be due to the low levels of PA reported by the Maltese population when compared to other countries, as only 36% of Maltese adults undergo a sufficient level of PA (WHO, 2018). Furthermore, 57.1% of participants in this study claimed that they sometimes tended to promote PA to their patients. The majority of nurses in the aforementioned studies promoted PA to their patients more commonly than the nurses in this study.

However, there was no significant relationship between the frequency of PA promotion to their patients and their own frequency in engagement in PA. Furthermore, there was an insignificant relationship between the nurses' years of experience and the frequency of PA promotion, as also established in the studies by Keough et al. (2017) and O'Hanlon and Kennedy (2014). This further enforces the fact that encompassing a great number of years of experience does not indicate that the nurse is necessarily an expert on the benefits of PA (Bobay, 2004).

5.3 Oncology nurses' generalised intention

The oncology nurses, on average, encompassed a positive intention towards performing the target behaviours. The local nurses possess a greater intention towards the promotion of PA than the nutritional management of their patients. This is due to the fact that some nurses strongly disagreed with the notion of being expected to, wanting to and intending towards being knowledgeable regarding the nutritional needs of their patients. Furthermore, the association attained between the nurses' intention regarding PA promotion suggests that nurse navigators possess a greater intention towards performing the target behaviour than staff nurses and senior staff nurses. This is related to another association attained in this study pertaining to the nurses' intention towards PA promotion and their place of work, whereby nurses in the Cancer Care Pathways Directorate encompassed a greater intention towards performing this behaviour than nurses in inpatient wards. Due to the nature of the specialist role that they possess, they are expected to be more knowledgeable, as well as have a greater intention towards gaining knowledge (Byrne et al., 2020). Previous literature did not attempt to assess the oncology nurses' intention towards the aforementioned behaviours, and therefore, comparisons may not be carried out.

5.4 Oncology nurses' attitudes towards nutritional management and the promotion of PA

With regards to the nutritional management of oncology patients, the nurses encompassed the greatest degree of agreement with regards to having a positive evaluation of this behaviour regarding the enhancement of their patients' HRQoL

and nutritional status. These findings reflect those obtained by Puhringer et al. (2015). Therefore, they possess the behavioural beliefs whereby not conducting nutritional management will result in their patients possessing a low HRQoL. This suggests that the nurses are aware of the evidence regarding the beneficial effect of nutritional support on the patients' physical functioning (Nguyen et al., 2021), emotional state and symptom control (de Oliveira et al., 2020).

Moreover, the majority of the nurses agreed with the fact that monitoring a patient's nutritional status is a basic component of nursing care. This is also seen in the study by Papier et al. (2014). Cass et al. (2013) also established that nurses in their study stated that nutritional management was a crucial aspect of their role, while being aware of professional boundaries with dieticians. This indicates that most nurses are conscious of their responsibilities pertaining to the nutritional management of their patients, however, not all nurses possess this awareness. Therefore, favourable patient outcomes may be guaranteed through the employment of standards of practice in order for oncology nurses to be more knowledgeable regarding their role to ensure that nutritional management occurs (Holder, 2003).

The nurses' attitude towards conducting repeated nutritional assessments was also a positive one, despite some nurses disagreeing to this. This reinforces the nurses' awareness of the evidence regarding the benefits of conducting repeated nutritional assessments in order to detect patients who are malnourished or at a risk of becoming malnourished as early as possible (Reber et al., 2019). Doing so is of epitome importance as early intervention leads to a reduction in associated hospital admissions, mortality and treatment complications (Schwegler et al., 2010). An association was attained in this study whereby those who never engaged in PA themselves possessed a higher attitude score than those who exercised between 1-2

times per week. This may be due to the fact that just because these nurses possess the knowledge regarding the importance of conducting PA, they do not necessarily conduct these behaviours themselves (Ross et al., 2017). Furthermore, another association was determined whereby a higher attitude score was obtained by those nurses who always promoted PA to their patients when compared to those who only promoted PA sometimes. This could have occurred as nurses who prioritise this target behaviour may be more knowledgeable on all lifestyle factors that lead to an improvement in patient outcomes (Murphy & Girot, 2012).

As regards to the nurses' attitude pertaining to the promotion of PA, the response which attained the highest score pertained to emphasising the importance of the referral of patients to other members of the multidisciplinary team who may aid in promoting PA. This may be due to their perceived lack of belief in their ability to conduct the target behaviour, as stated in Chapter 4 section 4.4.4.2. Gabrian et al. (2018) established that the patient's physical condition was a significant factor which influenced the nurses' attitude towards PA promotion. Therefore, if through the conduction of an assessment the nurses would have deemed the patient to be too weak, they will be less likely to promote PA (Gabrian et al., 2018). This may be the result of their lack of confidence in promoting the appropriate PA to these patients. However, by adopting a multidisciplinary approach, Dennett et al. (2021) stated that an improvement in patient-related outcomes regarding an enhancement in muscle and functional strength as well as a reduction in reporting depressive symptoms is attained. Therefore, encompassing an attitude whereby including other HCP, such as physiotherapists, is a highly positive finding.

The nurses also recognised the importance of ensuring that their patients are undergoing the appropriate PA while undergoing active treatment. This is highly

advantageous towards ensuring the patients' HRQoL due to the multitude of evidence regarding the positive effects of the conduction of PA during treatment and its associated improvement in bone density, increase in muscle mass, prevention of cachexia, improvement in balance in patients with chemotherapy induced peripheral neuropathy, which in turn, enhances the patient's ability to perform ADLs independently, treatment of lymphoedema, as well as a reduction of cancer-related fatigue, sleep disorders and depression (Ferioli et al., 2018).

A wide range of responses was observed in the survey item regarding whether the nurses think that patients bestow importance upon incorporating PA to aid in the improvement of their physical health. While the majority neither agreed nor disagreed, some disagreed while others strongly agreed with this statement. This suggests that the nurses' attitude towards PA promotion is dependent upon their own regard of their patients' enthusiasm towards performing PA (Gabrian et al., 2018). However, nurses are in the ultimate position to educate the patients regarding the importance of conducting PA throughout their cancer trajectory (Alderman et al., 2020). Therefore, significance should be given to promoting PA in an individualised manner that will encourage patients to partake in their recommended PA.

5.5 Oncology nurses' knowledge regarding nutritional management and the promotion of PA

In general, the nurses in the sample were quite knowledgeable. With regards to nutritional management, this reflects the findings in the study by Puhringer et al. (2015) where 75.5% of oncology nurses claimed to be knowledgeable regarding their patient's nutritional management.

The highest degree of agreement was based on the fact that a nutritional regime should be set up for patients who are at an increased risk of having a compromised intake. Furthermore, most were in agreement that patients should be weighed upon admission to hospital as well as when initiating treatment. This coincides with the results obtained by Papier et al. (2017) whereby 87% of the nurses claimed to conduct a nutritional assessment whenever a patient was admitted. The disagreement concerning the fact that nurses should initiate nutritional support only once treatment has been completed mirrors the result attained in the study by Loeliger et al. (2021). The latter stated that the nurses in their study claimed that while they aim to deliver information regarding the patient's nutritional needs at many points during their cancer trajectory, they perceive the time during and after their patients would have received their treatment as the most important point in which the nutritional aspect of the patient's care should be addressed. Ensuring that nutritional assessment and management occurs throughout the cancer trajectory is of ample importance as the patient's nutritional needs may alter at different phases of their cancer journey (Cushen et al, 2015). This may ensue due to a change in the patient's appetite as a result of the treatment being administered, which in turn, may bring about an effect on their ability to sustain an adequate oral nutritional intake. As a result, the patient's body composition and HRQoL may become compromised if repeated assessment and management does not occur (Aapro et al., 2014).

In the study sample, there was a range of responses regarding whether dieticians are to be held responsible for the patient's nutritional management rather than nurses. On average, the nurses neither agreed nor disagreed with this statement. A greater number of nurses in the study by Puhringer et al. (2015) believed that this responsibility should be held by the dietician rather than by nurses. However, in the

study by Papier et al. (2015), the majority of the nurses considered themselves to be accountable for their patient's nutritional status. This may be due to the fact that while the local nurses may be aware that nutritional assessment and management encompass a crucial aspect of their role, they may be aware of professional boundaries with dieticians (Cass et al., 2013). This may highlight the need for more specific standards of practice.

Nurses who exercised more than 5 times per week perceived themselves to be more knowledgeable than those who either did not undergo any PA at all, or than those who exercised between 1-2 times per week. This may be due to the fact that nurses who encompass a more active lifestyle are more inclined towards gaining knowledge regarding the importance of adequate nutrition. This, in turn, may result in them also prioritising being knowledgeable regarding the nutritional needs of their patients (Ross et al., 2017). Therefore, the data gained allows for the conclusion of one of the aims that the study set out to achieve, that is, that being knowledgeable does have an effect on the conduction of the target behaviour.

With regards to the promotion of PA, the nurses in this study were mostly knowledgeable regarding the fact that the conduction of PA results in an enhancement in the patient's mental health and ability to perform ADLs. Since none of the participants disagreed with this matter, the findings of this study reflect those attained by Keough et al. (2017). This is a highly advantageous finding since previous literature, such as the studies by Jones and Peppercorn (2010), Speck et al. (2010), Meyerhardt et al. (2009) and Mustian et al. (2009) all highlight the significance of ensuring the conduction of PA for patients before, during and after patients would have been receiving their treatment to ensure maintenance or improvement of their functional status and HRQoL.

However, despite this, it is evident that some nurses still encompass insignificant knowledge which will hinder them from promoting the benefits of PA. By recognising the significance that PA has on the reduction of cancer-related fatigue, as established in multiple studies such as the ones by Cheville et al. (2013), Hwang et al. (2012) and Kuehr et al. (2014), the nurses would give precedence to promoting PA.

Furthermore, the low mean score obtained in the survey item pertaining to the fact that patients who undergo PA will experience a decreased risk of cancer recurrence suggests that the nurses in the study are not knowledgeable about this fact. These findings reflect those by Koutoukidis et al. (2017) as many nurses claimed that they were not aware of the research evidence regarding the effects of PA on cancer recurrence. Notwithstanding this, the nurses in the study by Keough et al. (2017) were more knowledgeable regarding this fact. Therefore, this conveys the necessity of educating local nurses using evidence based practice regarding the importance of PA for cancer patients to improve the likelihood of PA promotion by these nurses.

Moreover, since an association was found in this study between the nurses' knowledge regarding PA and their age, whereby the younger nurses are more knowledgeable than the nurses who are between 51 and 60 years old, this implies that the required educational intervention should be initially targeted towards the latter group of nurses since they are the least likely to promote the benefits of PA to their patients. This reduced knowledge may be brought about by the fact that the study of exercise physiology has mostly occurred within the last thirty years (Brown et al., 2012). Therefore, the older nurses would may not have received much education pertaining to PA in their undergraduate program(Karvinen et al, 2012).

5.6 Oncology nurses' beliefs regarding nutritional management and the promotion of PA

In this study, the oncology nurses encompass most confidence in their ability to liaise with the appropriate members of the multidisciplinary team for the nutritional management of their patients. This is a positive finding as observed in the study by Lin et al. (2017), whereby including oncologists, nurses, dieticians and the patients themselves in the development of an individualised nutritional care plan resulted in an improvement in the patient's serum albumin and prealbumin levels, as well as weight gain, in patients receiving chemotherapy for advanced colorectal cancer, when compared to patients who were told to follow a standard nutritional guide. Furthermore, in the study by Findlay et al. (2020), patients with head and neck cancers whose nutritional management was conducted by the multidisciplinary team were more prone towards receiving radiotherapy ($p=0.041$) and systemic chemotherapy doses ($p=0.005$) as initially prescribed than those patients who were just provided with general guidelines to follow. There was also a 7% decrease in unplanned hospital admissions related to nutritional complications (Findlay et al., 2020). Therefore, the liaison of oncology nurses with the aforementioned professionals as well as the patients themselves in the latter's nutritional management is of epitome importance in order to improve the patient's outcomes.

Notwithstanding this, the nurses however did not feel like they were in control of whether a nutritional assessment ultimately occurs and whether a particular patient should be referred to a dietician. These findings reflect those by Puhringer et al. (2015) whereby less than half of the nurses in their sample believed that the conduction of nutritional management was entirely up to them to perform. This

presents a precarious situation as the appropriate patient referral may still be hindered from occurring if nurses feel that they must await instructions to conduct a nutritional assessment, thereby potentially impeding the patient's outcomes due to delays in the necessary nutritional interventions. This emphasises the significance of implementing a standard nutritional assessment tool to be conducted by the nurses which will aid nurses in determining when the referral of a patient to a dietician is necessary (Skipper et al., 2011). This will aid in instilling the nurses with more controllability, while ensuring that opportunities for intervention by a dietician are not overseen.

Moreover, a significant association was present between their beliefs pertaining to nutritional management and the timing of patient contact, whereby those who were in contact with patients throughout the whole trajectory encompassed more self-efficacy and controllability than those who were in contact with patients while the latter were receiving their treatment and in their aftercare. This may have ensued due to the former nurses having more opportunities to conduct a repeated assessment on their patients throughout their cancer journey (Cass et al., 2013).

With regards to the promotion of PA to oncology patients, the nurses neither agreed nor disagreed that they were confident in their knowledge pertaining to PA promotion guidelines. This reflects the results attained by Koutoukidis et al. (2017). However, in the study by Roberts et al. (2019), the clinical nurse specialists were confident in their abilities to provide the necessary PA promotion, as they also stated that they incorporate research evidence when promoting PA to their patients. A significant association was present in this study between the nurses' PA promotion beliefs, whereby nurse navigators encompassed greater confidence in their ability to perform the target behaviour than staff nurses. This may suggest that nurses who

possess a specialist role may carry out more research in part fulfilment of their role, thereby resulting in enhanced knowledge pertaining to guidelines, which in turn, will increase their confidence in carrying out the behaviour (Mina et al., 2018). Therefore, nurse navigators could potentially aid in the development of educative courses for staff nurses regarding PA guidelines so as to increase the latter's knowledge and confidence in conducting the target behaviour themselves.

A lack of controllability is also seen with regards to the inadequacy of the oncology nurses' perception in their sole ability in making a decision to refer their patient to a physiotherapist. Nurse navigators were more likely to report that this decision is up to them than staff nurses. This may be due to the fact that nurse navigators and physiotherapists are both involved in the multidisciplinary team meetings, and therefore, the nurse navigator may feel that they have the ability to confer the patient's need for physiotherapy more effectively.

5.7 Oncology nurses' perceived barriers regarding nutritional management and the promotion of PA

The ultimate barrier to the nutritional management of oncology patients comprised of their lack of knowledge regarding their patients' nutritional needs as a result of inadequate training during their undergraduate programme. While this barrier was also stated by the nurses in the study by Puhringer et al. (2015), there was a much lower percentage of nurses that perceived this lack of training to be a concern. This may be due to the fact that since the nurses in the aforementioned study were from Australia and New Zealand, their undergraduate curriculum could differ from that of the local university, and may include more education regarding the nutritional

management of oncology patients. However, in both studies, this barrier was more commonly cited by nurses who encompassed less years of professional experience. This suggests that possessing a higher number of years of experience allows for a greater number of opportunities for reflection upon their practice to occur (Morrison & Symes, 2011). Therefore, this allows nurses to draw upon previous encounters and experiences which will aid in enhancing their knowledge and confidence in conducting the appropriate nutritional management (Bobay et al., 2009). Moreover, the necessity of developing the nurses' knowledge through continuous professional development, particularly for younger oncology nurses, is evident (vanVeen et al., 2017).

Another barrier to nutritional management pertains to the lack of protocols and guidelines which are currently available to determine which patients require undergoing nutritional management. This barrier was also cited in the studies by Papier et al., (2014) Puhringer et al. (2015) and Williams et al. (2015). The latter stated that due to the association between the presence of guidelines and the provision of the appropriate nutritional management, the aforementioned barrier should be aimed to be diminished. This is due to the fact that through this screening process, a prediction regarding whether the implementation of a nutritional intervention would be advantageous for each patient based upon their nutritional status would be carried out (Cushen, 2015). The potential reduction of this barrier may be achieved through the implementation of guidelines regarding patients' nutritional management throughout the hospital. The nurses should then be educated regarding the use of these guidelines. Furthermore, audits should then be carried out at certain intervals to ensure that these guidelines are being adhered to and properly enforced by the oncology nurses (Spoon et al., 2020).

Furthermore, the oncology nurses felt that once a patient who requires nutritional intervention is identified, too much time then elapses from this recognition to the actual initiation of the intervention. This barrier was also cited by Puhringer et al. (2015) ,Williams et al. (2015) and Papier et al. (2017). The elimination of this barrier is of epitome importance as in order for interventions to be successful, they should be initiated immediately after their need is recognised (Lavdaniti, 2014). Moreover, an association was identified in this study between the timing of patient contact and this barrier, whereby those nurses who were in contact with patients only while these were receiving their treatment reported a greater degree of agreement towards this barrier than those who were in contact with patients both while these were receiving their treatment and during their aftercare, such as the nurse navigators. This highlights the significance of ensuring that the nurses are provided with a greater number of opportunities to discuss the nutritional aspect of their patients' care with them (Hopkinson, 2015). However, those nurses who were in contact with their patients throughout the latter's whole cancer trajectory reported a greater degree of agreement towards this barrier than those who were in contact with patients both while these were receiving their treatment and during their aftercare. Therefore, this suggests that despite encompassing a larger number of opportunities to meet with the patients, these nurses are still not finding enough time to initiate the appropriate nutritional management with their patients. This demonstrates the need for the establishment of support structures, such as pathways and guidelines which the nurses may follow in order to ensure that nutritional management in occurring in a timely manner (Brandes et al., 2015).

On average, the nurses seemed to neither agree nor disagree with the fact that there is a lack of availability of dietician services. The responses to this survey item

ranged from strongly agree to strongly disagree, suggesting that some nurses are not aware of the current services offered to their patients. At the time of conduction of the study, two outpatient clinics per week were available for patients to attend, while dieticians were also available to visit patients in in-patient wards once a referral would have been made by a medical officer. This highlights the current need for educating the oncology nurses regarding the current dietician services (Murphy et al., 2020). This is also of vital importance since the nurses do not perceive themselves as encompassing any barriers regarding their professional collaboration with other members of the multidisciplinary team, such as doctors and the dieticians themselves. This is a positive finding since collaboration between HCP leads to improved patient outcomes (Siedlecki & Hixson, 2015). Therefore, the likelihood of an appropriate and timely referral may be ensured if the nurses are more knowledgeable regarding the availability and role of dieticians.

The oncology nurses identified a lack of knowledge regarding PA promotion due to lack of prior training as the ultimate barrier towards the performance of the target behaviour. While this barrier was also established by Keogh et al. (2017), a much lower percentage of nurses reported experiencing this barrier than those in the local study. However, this study was also conducted with oncology nurses from Australia and New Zealand, thereby suggesting that their undergraduate curriculum could differ from the local one. In this study, an association was present between this barrier and the nurses' years of experience, whereby nurses who encompassed between 1 and 5 years of experience reported a greater degree of agreement to this barrier than those with a greater number of years of experience. This reflects the findings by Keogh et al. (2017) where nurses with more than 25 years of experience were less likely to identify this as a barrier towards the promotion of PA.

Another significant perceived barrier includes the lack of guidelines currently available to direct nurses as to which patients should conduct which type of PA. This barrier was mostly commonly cited in the study by O'Halon and Kennedy (2014) and Stevinson and Fox (2005). Furthermore, half of the nurses in the study by Williams et al. (2015) were not aware of any exercise guidelines. Roberts et al. (2019) highlights that this presents a risk of relaying inaccurate or vague information to patients. Due to this lack of formal guidance and potential lack of knowledge, Gabrian et al. (2018) established that nurses may be hindered from promoting PA to their patients due to their fear of causing the patient to overexert themselves. Therefore, this reinforces the need to provide them with accurate guidelines that would allow for these nurses to recommend PA more appropriately to their patients.

The nurses in the study sample neither agreed nor disagreed with the barrier pertaining to them encompassing a lack of time to spend with their patients to discuss PA. This barrier was present in studies by O'Hanlon and Kennedy, Williams et al. (2015), Keogh et al. (2017), Haussmann et al. (2018), and Koutoukidis et al. (2018). The difficulty in overcoming this barrier lies in the fact that oncology nurses encompass a very demanding schedule, and therefore, may not choose to prioritise PA in the care that they provide if they are feeling overwhelmed with the need to complete other tasks (Gabrian et al., 2018). This highlights the need for establishing clear referral pathways to physiotherapists, particularly for patients with a complex clinical presentation. By doing so, the promotion of PA is not hindered in patients were other nursing tasks might be prioritised while also ensuring that the most suitable PA advice is provided in more perplexing cases.

Furthermore, an association was established in this study between the perceived barriers and the nurses' place of work, whereby those nurses who worked in the Day

Ward stated a greater degree of agreement to this barrier than those nurses who work in the in-patient wards and in the Cancer Care Pathways Directorate. Moreover, an association between the barriers and the timing of patient contact was also found. The latter established that nurses who are in contact with patients only while these are receiving their treatment are more likely to claim a higher degree of agreement to these barriers than those nurses who are present both while the patients are receiving their treatment and during aftercare, as well as those who are present throughout the patient's whole trajectory. Therefore, nurses who work in the Day Ward have a more limited time to promote PA to their patients since they are only in contact with them while the latter are receiving their necessary treatment, and are therefore the ones whose nursing care may be most affected due to this barrier. This suggests that these nurses need to be educated regarding the significance of utilising the limited time that they have with their patients to their advantage, by establishing a therapeutic relationship and initiating conversations regarding the patients' PA habits (Koutoukidis et al., 2018).

The majority of the nurses disagreed with the survey item stating that patients with a poor diagnosis will not benefit from PA. This finding is favourable and contrasts with those in the study by Williams et al. (2015) whereby the majority of the nurses believed that PA would not affect cancer outcomes. Giving the growing evidence regarding the importance of PA promotion post diagnosis, such as in the studies by Schrack et al. (2017) and Arrieta et al. (2019), this suggests that the local population of nurses are more knowledgeable regarding the matter than the nurses in the study by Williams et al. (2015).

Furthermore, the majority of the nurses disagreed with the notion that they feel that they are not responsible for promoting PA to patients. This finding was also

attained in the study by Koutoukidis et al. (2018) whereby some nurses claimed that they felt empowered towards promoting PA to their patients. However, the range of responses attained suggests that some nurses did agree to the aforementioned statement. Therefore, the likelihood of the latter promoting PA to their patients is reduced. This further reinforces the need for guidelines in order to establish the extent of the nurses' responsibility in conducting the target behaviour.

5.8 Oncology nurses' willingness to learn

Enhancing oncology nurses' knowledge would result in enhanced patient outcomes since having the required knowledge would increase their self-efficacy in demonstrating the target behaviours. Therefore, the fact that the local nurses are agreeable towards enhancing their knowledge and beliefs pertaining to the target behaviours is a highly positive finding. Most oncology nurses were generally interested in undertaking an online web-based course, whereby the lectures may be accessed at the nurses' own convenience. In a study conducted by Karvinen et al. (2017), which aimed to determine whether the implementation of online learning modules would ensue in an enhancement in the oncology nurses PA promotion practices, it was a concluded that this type of learning resulted in oncology nurses who encompassed higher levels of self-efficacy regarding PA promotion practices ($F[1,52] = 7.87$, $p < 0.001$, 95% CI [0.26, –1.6]) and who experience less barriers towards promoting PA to their patients ($F[1,52] = 6.6$, $p < 0.01$, 95% CI [–1.1, –0.13]) when compared to those nurses who did not undergo any online learning interventions. These findings further reinforce the advantages associated with this choice of educational intervention, since this study revealed that the local oncology

nurses encompass a low PBC regarding their ability to perform PA promotion, implementing this educational intervention may aid in improving this, thereby enhancing the probability of PA promotion occurring effectively.

The potential effectiveness of the other proposed educational interventions may not be evaluated in relation to the current evidence as no studies were previously conducted on the latter. Despite the option to job shadow dieticians and physiotherapists being the least preferred option, its potential should not be overlooked. Since nurses who have attained a higher intention, attitude and belief score pertaining to nutritional management were more likely to choose to undergo job shadowing, providing nurses with the opportunity to job shadow nutritionists may aid in enhancing these aspects. This is significant since the local nurses, on average, encompass a lack of belief in their ability to perform adequate nutritional management. However, employing this educational intervention may be time consuming since only a few nurses may be allocated to a nutritionist per session.

5.9 Application of the TPB to the study findings

With regards to the application of the TPB to the study to determine the nurses' intention towards promoting PA to their patients, the nurses encompassed an attitude whereby they were in favour of conducting this behaviour. This may be determined through their behavioural beliefs, because of which, ensuring that patients are conducting the appropriate PA during treatment and to the adequate referral of patients to other members of the multidisciplinary team who may aid in PA promotion. Encompassing this attitude thereby aids in ensuring that their patients' HRQoL is safeguarded. With regards to their subjective norms, since the nurses

neither agreed nor disagreed with the fact that patients expect their nurses to promote PA, they only currently possess moderate normative beliefs. Moreover, the nurses also lacked confidence in the knowledge that they had regarding PA promotion guidelines as well as their decision-making abilities regarding the need for a referral to a physiotherapist. Therefore, according to the TPB, due to this low perceived control over the behaviour, lack of self-efficacy in promoting PA, the nurses possess a moderate to low intention regarding the conduction of the target behaviour, despite attaining high scores in the generalised intention construct, thereby suggesting that the target behaviour is not being conducted.

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attaining high scores in the generalised intention construct, thereby suggesting that the target behaviour is not being conducted.

5.10 Strengths and limitations of the study

This is the first research project conducted locally which investigated the attitudes, knowledge, beliefs and perceived barriers of the oncology nurses working in SAMOC. This aided in laying the foundation for future studies. This is of particular importance if educational interventions based upon this study's recommendations are implemented. Furthermore, comparisons of the aforementioned constructs could be made between the local nurses and those included in international studies which aided in determining the strengths of the current nursing care, but also, the need for improvement in undergraduate teaching and training in particular aspects. Moreover, since all of the local population of oncology nurses was included, a representative sample was assured.

Moreover, a high response rate was attained to further assure that the sample was representative of the population. This was aimed to be established through the dispatch of a reminder e-mail two weeks after the study had been initiated. Therefore, the risk of non-response bias in this study is low. This is of significance because the participants' own lifestyle decisions may affect the importance that they perceive nutritional management and the promotion of PA to possess in the care that they provide.Therefore, the non-responders may have been nurses who do not deem themselves to be knowledgeable regarding the target behaviours (Groves, 2006). Due to these facts, their participation in the study may have altered the acquired results.

Item non-response occurs when a particular survey question is not completed (Rässler & Riphahn, 2006). The probability of bias as a result of this was minimised by providing the frequencies and percentages of the attained results according to the number of participants who answered that survey question. Moreover, since an intermediary was utilised to distribute the survey via an e-mail, care was taken in assuring that the total number of nurses that this e-mail was being sent to was relayed to the researcher. This was important so as to be able to calculate the response rate, as in the studies by Puhringer et al. (2017) and Keough et al. (2017), this could not be done since the total number of nurses invited to participate was not known by the researchers.

Furthermore, due to the small sample size, there is an enhanced possibility of a Type II error affecting the obtained results, that is, the results approve the study hypothesis when the alternative hypothesis would have actually been correct (Etz & Arroyo, 2015). This, in turn, would diminish the power of the study due to a decreased capability in exposing an effect when one should have been exposed (Hackshaw, 2008). However, despite this low number of participants, the number of potential nurses to be recruited was restricted by the all over small population of local oncology nurses that were present at the time of conduction of this study. Therefore, due to the high response rate attained, the sample size is justified.

Since this was the first local study to be conducted on the research topic, as mentioned above, adopting a quantitative approach is considered as a strength to the study. This is because doing so allowed for the attainment of descriptive data which could undergo statistical analysis in order to obtain a highly comprehensive picture of the research question. Furthermore, the various socio-demographic data that was inquired in the survey allowed for multiple tests for associations to be conducted,

which in turn, further strengthens the study by gaining an even more extensive understanding of the local population of oncology nurses.

A limitation to the study includes the absence of utilising a mixed-methods approach encompassing an explanatory sequential design. Adopting this approach would have allowed the researcher to gain further insight and gain knowledge regarding how personal experiences explain the quantitative data. This would have been advantageous as the constructs could have been further understood due to their subjective nature. However, due to the extensive amount of time that is required to conduct a mixed-methods study, and due to the time constraints to complete this study, the adoption of this approach would not have been feasible.

Furthermore, since the research tool was developed by the researcher herself who did not have prior experience in doing so, significant questions that would have contributed to valuable data regarding the constructs may have not been included, while the included items may not have been included appropriately. However, this limitation was decreased through the conduction of a content validity study, as explained in Chapter 3 Section 3.7.2.

5.11 Conclusion

In this chapter, the findings are discussed in relation to the aims and objectives of this study. The relation of these results to the theoretical framework of the study was also discussed, as well as the strengths and recommendations of the study. The next chapter presents a synthesis of the study's findings, as well as recommendations for future research, practice and education based on these findings.

Chapter 6: Conclusion

Chapter 6: Conclusion

6.1 Introduction

This research study was aimed towards investigating the local oncology nurses' attitudes, knowledge, beliefs and perceived barriers towards the nutritional management and promotion of PA among the local population of oncology patients. A comprehensive understanding of this research topic was achieved through the evaluation of the association of the nurses' socio-demographic and lifestyle factors to the aforementioned constructs. This was done to determine whether the presence of any association effects the nurses' conduction of the target behaviours. Therefore, this chapter aims to discuss the synthesis of findings in relation to the research question, study's objectives and current literature regarding nutritional management and promotion of PA. This is followed by a discussion of the implications of the research's findings for research, practice and education and to conclude what interventions are likely to be effective for enhancing the target behaviours. Finally, it provides recommendations for future work and an overall conclusion to this research.

6.2 Synthesis of research findings

This research has established that the local oncology nurses encompass a great intention towards conducting both target behaviours. However, their intentions were greater with regards to promoting PA rather than conducting the nutritional management of their patients. No associations between any of the socio-demographic and lifestyle factors and the latter behaviour were established. However, a highly

significant association was present which established that nurse navigators who worked within the Cancer Care Pathways Directorate encompassed a greater intention towards PA promotion than staff nurses and senior staff nurses who worked in any other ward. This was due to the highly significant relationship between the nurses' role and their place of work. Furthermore, this emphasises the need for nurse navigators to be involved in the continuous professional development of staff nurses and senior staff nurses in order to enhance the latter's intentions towards promoting PA. Since intention is the forerunner of behaviour, the probability of conduction of PA promotion is enhanced, as well as its associated benefits to the patients' HRQoL.

Moreover, the local nurses encompassed a positive attitude towards the nutritional management of their patients, particularly with regards to the improvement that doing so brings about to their patients' nutritional status. However, they had the least positive attitude towards the conduction of a repeated nutritional assessment on their patients. Tests for associations revealed that a highly significant association was present between encompassing a positive attitude towards nutritional management and nurses who always promoted PA to their patients, rather than those who only promoted PA sometimes. These findings emphasise the need for encouraging the local nurses to increase their frequency of PA promotion through education in order to enhance their attitude towards nutritional management. Since a significant relationship was present between the frequency of PA promotion and the nurses' role, whereby senior staff nurses and nurse navigators were more likely to promote PA than nurses encompassing any other role, the education of staff nurses regarding the matter should be prioritised.

With regards to the local nurses' attitude towards PA promotion, they were mostly in agreement with referring patients to physiotherapists since they may aid in

promoting PA. This suggests that the nurses lack controllability regarding the conduction of this behaviour, as evident in the beliefs construct. Moreover, the nurses may also lack the necessary self-efficacy pertaining to their knowledge on the most appropriate PA for different patients with various diagnoses and clinical presentations, as also demonstrated in the beliefs construct. An association was present between the nurses' beliefs regarding PA and their role, whereby both senior staff nurses and nurse navigators encompassed greater beliefs regarding the target behaviour than staff nurses. Therefore, the latter group of nurses should be the preferred group for continuous professional education aimed towards enhancing their controllability and self-efficacy pertaining to PA promotion.

Despite this, the local nurses comprised an attitude whereby they recognised the importance of ensuring that their patients perform the appropriate PA while undergoing active treatment. These findings reflect those attained in the knowledge construct, since on average, the majority of nurses disagreed with the fact that patients who conduct PA will experience a greater amount of cancer-related pain, cancer-related fatigue, or that PA has no benefits whatsoever to their patients. However, the local nurses were not knowledgeable regarding the fact that the conduction of PA will decrease their patients' risk of cancer recurrence, despite the available literature stating the significance of PA in the post-treatment stage of their cancer trajectory. The association attained between the nurses' knowledge regarding PA promotion and their age suggests that older nurses should be given initial importance towards being educated on the matter, since nurses between the ages of 31 and 40 were more knowledgeable than those between the ages of 51 and 60.

From the findings of the knowledge construct pertaining to the nutritional management of oncology patients, it was established that the nurses were mostly well

informed regarding the significance of routinely weighing patients upon every hospital admission or treatment appointment, and of setting up a nutritional regime for patients who would be at a higher risk of having a compromised nutritional intake. Consequently, they disagreed with the fact that nutritional support should commence only once their patients' treatment has been completed. This knowledge is reinforced by the nurses confidence in their abilities to utilise the appropriate nutritional screening tools and in providing the necessary nutritional management to their patients, the conclusion of which may be drawn through the findings obtained in the beliefs construct. Furthermore, an association between the latter construct and the nurses' timing of patient contact, whereby those nurses who were in contact with their patients throughout their cancer trajectory possessed a greater level of beliefs than those who were in contact only during their patients' treatment and aftercare was observed. This emphasises the need for ensuring that the nurses are provided with multiple opportunities for nutritional assessment and management in order to enhance their confidence and sense of control over performing the behaviour independently.

Despite this, the nurses were neither in agreement nor in disagreement regarding whether dieticians should be held responsible for their patients' nutritional support. This suggests that significance should be placed upon established standards of practice within the local oncology centre in order to ease this uncertainty on the matter. By detailing the responsibilities of each profession, the enhancement and management of the patients' nutritional status may be safeguarded while limiting any potential apprehension and afflict that the local nurses may be experiencing due to the crossing of professional boundaries. Furthermore, since the nurses encompass

controllability over liaising with dieticians, as evident in the beliefs construct, the successful implementation of these standards of practice are ensured.

This study revealed that the greatest barrier towards the nutritional management of oncology patients is that the nurses perceived themselves to have deficient knowledge regarding their patients' nutritional needs due to lack of training in their undergraduate programme. These findings seem to contradict those attained in the knowledge construct. However, while the nurses may feel that they are knowledgeable regarding the manner in which nutritional management should be conducted, they may not feel that they are knowledgeable enough on how to educate their patients regarding their nutritional requirements. Moreover, an association between this barrier and the nurses' years of experience was established, whereby those who had less than one year of experience claimed to experience this barrier more than those who had 11 to 15 years of experience. This barrier may be reduced through the organisation of an orientation seminar where nurses who are experts on the matter may relay relevant information to newly qualified nurses, as well as through other seminars throughout the years in order to provide the latest evidence based findings to oncology nurses.

A lack of protocols and guidelines to aid in nutritional assessment and the formulation of an appropriate care plan was also a very evident barrier to these nurses. Moreover, the findings suggest that too much time elapses from the identification of a patient who requires a nutritional intervention to the formulation of a nutritional plan. Therefore, this emphasis the need for the establishment of guidelines detailing when and how a nutritional assessment should be conducted, as well as the requirement for protocols to formulate the most appropriate nutritional plan depending on the patients' identified nutritional risk in a timely manner. Due to

the association present between this barrier and time timing of patient contact, whereby those nurses who were in contact with patients only while these were receiving their treatment reported a greater degree to agreement to this barrier than those who are in contact with the patient throughout their cancer trajectory, may explain why they feel that interventions do not occur in a timely manner. These nurses should be educated on time management, and how to use their limited amount of time effectively with their patients in order to ensure that nutritional management occurs appropriately.

Additionally, some nurse claimed that there was a lack of availability of dietician services at the time of conduction of this study. However, as detailed in Chapter 5 Section 5.7, this was not the case. Therefore, the management should ensure that the nurses are informed of the services that may be offered to their patients. This may be easily achievable by sending an information e-mail to all staff to inform them of the nature and how to utilise their service, or by creating a post on the Oncology Centre's intranet for all staff to be able to access and refer to at their convenience.

A lack of knowledge regarding how to incorporate PA in the care of oncology patients resulting from lack of prior training was also what the local nurses perceived to be the ultimate barrier towards promoting PA. This contradicts another barrier whereby the majority of nurses disagreed with the fact that PA is hindered from being promoted due to patients not benefiting from PA as a result of a poor diagnosis and prognosis. This also contradicts the aforementioned findings related to the knowledge construct since on average, the nurses were knowledgeable on the items presented in the survey. Therefore, this barrier may be overcome by incorporating evidence based findings pertaining to the significance of PA throughout the cancer

trajectory when also conducting the necessary seminars. An association was present between this barrier and the nurses' years of experience as those with 1 to 5 years of experience perceived themselves to encounter more barriers than those with a greater number of years of experience. However, due to the previous finding whereby older nurses were found to be less knowledgeable on the positive effects of PA on their patients, this education should be targeted towards all oncology nurses.

Since the nurses identified the lack of guidelines currently available at the Oncology Centre pertaining to PA promotion, these should be aimed to be established in order to assure that the appropriate exercises are relayed towards patients with particular clinical presentations. These guidelines should be easily accessed by all staff by publishing them on the local intranet in order to ensure their ease of access and use.

Lastly, while many nurses disagreed with the notion that they did not have enough time available with their patients to discuss PA, this was barrier mostly present in nurses who worked in the Day Care Ward as a result of only being in contact with the patient while these are receiving their treatment. This may be due to the various patients that they will have under their care at one point in time, as well as the various time demanding protocols of medications that they need to deliver to each patient. Furthermore, the patients may be experiencing side effects as a result of this treatment, such as chemotherapy-induced nausea and vomiting, and therefore, may not be in the position to listen to and retain information regarding PA. This suggests that these discussions may be best had by nurse navigators since they are in contact with patients throughout their cancer trajectory, or by nurses in inpatient wards once their patients would have recovered from the side effects of their treatment.

The local nurses were agreeable towards enhancing their knowledge regarding the target behaviours. This is a very positive finding due to the aforementioned need to improve their current knowledge on certain aspects of nutritional management and PA promotion. The most common choice of educational intervention among the oncology nurses included undertaking an online web-based course, whereby the lectures may be accessed at the nurses' own convenience.

6.3 Recommendations

Through the findings attained in this study, a number of recommendations pertaining to the conduction of research to further develop the current evidence, as well as recommendations for enhancing the current education and practice are recognised.

6.3.1 Recommendations for education

- The implementation of educational interventions regarding the proper conduction of nutritional assessment, particularly for patients who would be experiencing side effects due to their treatment or who have a compromised oral intake as a result of their localised tumour, in order to enhance the nurses' confidence in assessing and caring for these patients appropriately.
- Educating the nurses, particularly those nurses between 51 and 60 years of age, as well as those with less years of professional experience, regarding the effects of timely nutritional intervention on the reduction in their patients' risk of cancer recurrence to ensure that promotion of PA is enhanced by this group of nurses.

- Ensuring continuous professional development through the establishment of online lectures whereby the latest research evidence regarding oncology patients' nutritional management and the significance of conduction of PA is discussed with oncology nurses.

6.3.2 Recommendations for practice

- The formulation of standards of practice regarding the oncology nurses' role in the nutritional assessment and management of their patients. This is significant in order to decrease any hindrances currently present as a result of uncertainty of crossing of professional boundaries between nurses and dieticians at the potential expense of the ultimate patient outcomes.
    - The establishment of a standard nutritional assessment tool and guidelines regarding the conduction of repeated nutritional assessment in an effort to decrease the lack of controllability of achieving this target behaviour in those nurses who were in contact with their patients once these are receiving their treatment and during their aftercare.
    - The establishment of guidelines which aim to provide information based on evidence regarding the timely manner in which nutritional management should occur in order to decrease the amount of time which elapses between when a patient is assessed and determined to require nutritional management and when this intervention actually commences.
    - The implementation of guidelines regarding which patients should be conducting which type of PA in order for the patients to achieve the greatest possible HRQoL. Furthermore, this will aid to enhance the promotion of PA by

nurses who may choose not to prioritise the conduction of this target behaviour in the provision of their care if they would be feeling overwhelmed and unsure as to which exercises will benefit the patients.

- The establishment of a referral pathway to exercise specialists such as physiotherapists in patients with complex clinical presentations who encompass multiple co-morbidities. This pathway should be made especially available to nurses in the Day Care Ward who are only in contact with patients while these are receiving their treatment and who experience the greatest barrier towards promoting PA due to their perception of encompassing a limited amount of time with their patients.
- The conduction of audits following the implementation of these recommended standards of practices and guidelines so as to ensure that they are being adhered to and resulting in an improvement in the quality of the nursing care provided, and subsequently, in an advancement in patient outcomes.

6.3.3 Recommendations for further research

- The conduction of a qualitative study either through focus groups or interviews in order to gain a comprehensive understanding of the oncology nurses' attitudes, knowledge, beliefs and perceived barriers towards the nutritional management and promotion of PA to oncology patients.
- Further studies are required to determine the most appropriate and effective educational intervention to be implemented so as to strengthen the oncology nurses' confidence in engaging in the target behaviour, as well as to expand their knowledge regarding the subject matter.

- The conduction of a longitudinal study following the implementation of an educational intervention aimed towards enhancing the oncology nurses' knowledge and PBC over the target behaviours in order to determine whether any improvements in the aforementioned would have occurred. This is of epitome importance since possessing knowledge and a high PBC is associated with a greater intention towards executing the target behaviour.
- Reinforcing the current research by carrying out a quantitative study to compare the attitudes, knowledge, beliefs and perceived barriers of local oncology nurses who care for palliative patients only to those who care for all other oncology patients. This will aid in ensuring that the patients' HQoL is being safeguarded regardless of the patients' prognosis by recognising whether these nurses possess the intention towards performing the appropriate target behaviour for palliative patients.

6.4 Conclusion

This was the first research study to explore the local oncology nurses' attitudes, beliefs, knowledge and perceived barriers towards the nutritional management and promotion of PA to oncology patients, while also obtaining socio-demographic information regarding the population of oncology nurses. Furthermore, it was the first study that aimed to attain a truly comprehensive comprehensive understanding of the topic through the conduction of an extensive list of socio-demographic factors. The findings of the study suggest that with regards to nutritional management, these nurses encompass a positive attitude towards the behaviour, while being mostly well informed regarding most aspects of the nutritional care of cancer patients, but require

enhancements in their confidence in their abilities to perform this behaviour. With regards to the promotion of PA, the local nurses also possess a positive attitude towards this behaviour and the majority are quite knowledgeable on most factors pertaining to the effect of PA on oncology patients. However, they lack the PBC that they require to promote PA effectively. The nurses determined a lack of training in their undergraduate program as well as a lack of guidelines and protocols pertaining to both target behaviours as the main barriers to the conduction of the behaviour.

In conclusion, the findings suggest that staff nurses, particularly those who are older than 51 years of age, or those with either less years of experience in the oncology setting, as well as those who are only in contact with patients while the latter are receiving their treatment should be targeted by having them undertake online lectures. This should be done in order to enhance these nurses' knowledge, PBC while hindering the barriers to the target behaviours that they are currently experiencing to enhance the quality of nursing care that they may provide to their patients.

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Appendix A: Appraisal tool for cross-sectional studies (AXIS)

Appraisal of Cross-sectional Studies

	Question	Yes	No	Don't know/ Comment
Introduction				
1	Were the aims/objectives of the study clear?			
Methods				
2	Was the study design appropriate for the stated aim(s)?			
3	Was the sample size justified?			
4	Was the target/reference population clearly defined? (Is it clear who the research was about?)			
5	Was the sample frame taken from an appropriate population base so that it closely represented the target/reference population under investigation?			
6	Was the selection process likely to select subjects/participants that were representative of the target/reference population under investigation?			
7	Were measures undertaken to address and categorise non-responders?			
8	Were the risk factor and outcome variables measured appropriate to the aims of the study?			
9	Were the risk factor and outcome variables measured correctly using instruments/measurements that had been trialled, piloted or published previously?			
10	Is it clear what was used to determined statistical significance and/or precision estimates? (e.g. p-values, confidence intervals)			
11	Were the methods (including statistical methods) sufficiently described to enable them to be repeated?			
Results				
12	Were the basic data adequately described?			
13	Does the response rate raise concerns about non-response bias?			
14	If appropriate, was information about non-responders described?			
15	Were the results internally consistent?			
16	Were the results presented for all the analyses described in the methods?			
Discussion				
17	Were the authors' discussions and conclusions justified by the results?			
18	Were the limitations of the study discussed?			
Other				
19	Were there any funding sources or conflicts of interest that may affect the authors' interpretation of the results?			
20	Was ethical approval or consent of participants attained?			

Appendix B: The research instrument

What are oncology nurses' attitudes, beliefs and perceived barriers towards the implementation of nutritional care management and promotion of physical activity in oncolo patients?

Demographic information

1. Age:

- ◯ 20-30
- ◯ 31-40
- ◯ 41-50
- ◯ 51-59
- ◯ 60+

2. Gender

- ◯ Male
- ◯ Female
- ◯ Other

3. Level of education

- ◯ Diploma
- ◯ Degree
- ◯ Masters
- ◯ Doctorate

4. Years of experience of working in the oncology setting:

- ◯ Less than 1 year
- ◯ 1-5 years
- ◯ 6-10 years
- ◯ 11-15 years
- ◯ 16-20 years
- ◯ More than 20 years

5. Role in oncology setting:

- ○ Staff nurse
- ○ Senior staff nurse
- ○ Deputy charge nurse
- ○ Charge nurse
- ○ Practice nurse
- ○ Other (please specify)

6. Place of work within the oncology setting:

- ○ Outpatients Department
- ○ Inpatient wards
- ○ Day Care Ward
- ○ Other (please specify)

7. Timing of patient contact:

- ○ The whole trajectory
- ○ During diagnosis and treatment
- ○ Only during treatment
- ○ During treatment and aftercare
- ○ Only after treatment

8. How often do you personally engage in physical exercise?

- ○ Never
- ○ 1-2 times per week
- ○ 3-4 times per week
- ○ 5 or more times per week

9. How often have you promoted physical activity to your patients in the last three months?

- ○ Always
- ○ Sometimes
- ○ Rarely
- ○ Never
- ○ I advise against physical activity

What are oncology nurses' attitudes, beliefs and perceived barriers towards the implementation of nutritional care management and promotion of physical activity in oncolo patients?

Nutritional care management - generalised intention

10. I am expected to be knowledgeable regarding the nutritional needs of my patient and to promote physical activity

Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
○	○	○	○	○

11. I want to be knowledgeable regarding the nutritional care that I should be providing to my patients

Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
○	○	○	○	○

12. I intend to improve my knowledge regarding the nutritional care that my patients require

Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
○	○	○	○	○

What are oncology nurses' attitudes, beliefs and perceived barriers towards the implementation of nutritional care management and promotion of physical activity in oncolo patients?

Nutritional care management - measure of attitude

13. Monitoring a patient's nutritional status is a basic component of nursing care.

Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
○	○	○	○	○

14. Patients should undergo repeated nutritional assessment every week of hospitalisation, or every treatment appointment.

Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
○	○	○	○	○

15. Nutritional assessment and management by nurses improves the patient's health related quality of life and nutritional status

Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
○	○	○	○	○

What are oncology nurses' attitudes, beliefs and perceived barriers towards the implementation of nutritional care management and promotion of physical activity in oncolo patients?

Nutritional care management - outcome evaluations of attitude

16. Ensuring that monitoring of the patient's nutritional status is satisfactory is:

Not at all important	Not so important	Somewhat important	Very important	Extremely important
○	○	○	○	○

17. Conducting repeated nutritional assessments is:

Not at all important	Not so important	Somewhat important	Very important	Extremely important
○	○	○	○	○

18. Ensuring that patients are experiencing the highest possible health related quality of life throughout the whole trajectory is:

Not at all important	Not so important	Somewhat important	Very important	Extremely important
○	○	○	○	○

What are oncology nurses' attitudes, beliefs and perceived barriers towards the implementation of nutritional care management and promotion of physical activity in oncolo patients?

Nutritional care management - measure of subjective norm

19. Nurses should commence nutritional support only once treatment has been completed

Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
○	○	○	○	○

20. Patients should be weighed upon admission or upon initiating treatment

Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
○	○	○	○	○

21. Dieticians, rather than nurses, are responsible for nutritional support

Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
○	○	○	○	○

22. Patients should be encouraged to eat smaller and more frequent portions rather than larger meals

Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
○	○	○	○	○

23. Patients should be encouraged to consume foods which provide them with high levels of energy and that contain levels of protein

Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
○	○	○	○	○

24. A nutritional regime should be set up for patients at a higher risk of having a compromised nutritional intake

Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
○	○	○	○	○

25. In the case of hospitalised patients, a nutritional care plan should be provided to the patient upon discharge

Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
○	○	○	○	○

What are oncology nurses' attitudes, beliefs and perceived barriers towards the implementation of nutritional care management and promotion of physical activity in oncolo patients?

Nutritional care management - measure of perceived behavioural control

26. I am confident in my existing knowledge regarding which is the most appropriate nutritional screening tool to use on oncology patients

Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
○	○	○	○	○

27. I am confident in my abilities to administer the appropriate nutritional care to my patients

Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
○	○	○	○	○

28. I am confident in my abilities to liaise with other members of the multidisciplinary team as necessary

Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
○	○	○	○	○

29. The decision as to whether a nutritional assessment should take place is entirely up to me

Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
○	○	○	○	○

30. The decision as to whether a patient requires a referral to a dietician is entirely up to me

Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
○	○	○	○	○

What are oncology nurses' attitudes, beliefs and perceived barriers towards the implementation of nutritional care management and promotion of physical activity in oncolo patients?

Nutritional care management - determining structural barriers

The following are potential structural barriers that may be currently present, and therefore may hinder effective nutritional assessment and care from occurring. Kindly determine the extent of agreement or disagreement to the following statements.

31. Too much time elapses from when a patient who requires nutritional intervention is identified to formulating a nutritional care plan or regime

Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
○	○	○	○	○

32. Lack of protocols and guidelines are currently available to determine which patients require undergoing nutritional assessment and that aid in formulating an appropriate nutritional care plan

Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
○	○	○	○	○

33. Nurses have deficient knowledge regarding oncology patients' nutritional needs due to lack of training during the undergraduate programe

Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
○	○	○	○	○

34. Lack of availability of dietician services

Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
○	○	○	○	○

35. Lack of collaboration between nurses, dieticians, doctors and other multidisciplinary team members

Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
○	○	○	○	○

36. Other:

What are oncology nurses' attitudes, beliefs and perceived barriers towards the implementation of nutritional care management and promotion of physical activity in oncolo patients?

Promotion of physical activity - generalised intention

37. I intend to increase my abilities and knowledge regarding the promotion of the most appropriate type of physical activity to my patients

Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
○	○	○	○	○

38. I intend to discuss the importance of physical activity with my patients

Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
○	○	○	○	○

What are oncology nurses' attitudes, beliefs and perceived barriers towards the implementation of nutritional care management and promotion of physical activity in oncolo patients?

Promotion of physical activity - measure of attitude

39. As a nurse, the encouragement of oncology patients to participate in physical activity is

Not at all important	Not so important	Somewhat important	Very important	Extremely important
○	○	○	○	○

40. The referral of patients to other members of the multidisciplinary team who may aid in promoting physical activity is:

Not at all important	Not so important	Somewhat important	Very important	Extremely important
○	○	○	○	○

41. I think that patients believe that the incorporation of physical activity with regards to its effect on their physical health is:

Not at all important	Not so important	Somewhat important	Very important	Extremely important
○	○	○	○	○

42. Performing the appropriate physical activity while undergoing active treatment is:

Not at all important	Not so important	Somewhat important	Very important	Extremely important
○	○	○	○	○

43. Performing the appropriate physical activity after completing treatment is:

Not at all important	Not so important	Somewhat important	Very important	Extremely important
○	○	○	○	○

What are oncology nurses' attitudes, beliefs and perceived barriers towards the implementation of nutritional care management and promotion of physical activity in oncolo patients?

Promotion of physical activity - measure of subjective norm

44. Patients who perform physical activity will experience a greater amount of cancer-related pain

Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
○	○	○	○	○

45. Patients who perform physical activity are at a greater risk of experiencing cancer-related fatigue

Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
○	○	○	○	○

46. Patients who undergo physical activity will experience an improvement in their mental health and ability to perform activities of daily living

Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
○	○	○	○	○

47. Patients who undergo physical activity will experience a decreased risk of cancer recurrence

Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
○	○	○	○	○

48. Performing physical activity has no benefits whatsoever to oncology patients

Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
○	○	○	○	○

What are oncology nurses' attitudes, beliefs and perceived barriers towards the implementation of nutritional care management and promotion of physical activity in oncolo patients?

Promotion of physical activity - measure of perceived behavioural control

49. I am knowledgeable regarding the current guidelines pertaining to the promotion of physical activity in oncology patients

Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
○	○	○	○	○

50. The decision as to whether a patient should be referred to a physiotherapist is entirely up to me

Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
○	○	○	○	○

What are oncology nurses' attitudes, beliefs and perceived barriers towards the implementation of nutritional care management and promotion of physical activity in oncolo patients?

Promotion of physical activity - determining structural barriers

The following are potential structural barriers that may be currently present, and therefore hinder the promotion of physical activity from occurring. Kindly determine the extent of agreement or disagreement to the following statements.

51. Lack of time available to spend with the patient to discuss physical activity

Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
○	○	○	○	○

52. Lack of knowledge regarding how to incorporate physical activity in the care of oncology patients due to lack of prior training

Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
○	○	○	○	○

53. Lack of guidelines to follow with regards to which patients should undergo which type of physical activity

Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
○	○	○	○	○

54. I feel that it is not my responsibility to promote physical activity to patients

Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
○	○	○	○	○

55. Patients with a poor diagnosis will not benefit from physical activity

Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
○	○	○	○	○

56. Other:

What are oncology nurses' attitudes, beliefs and perceived barriers towards the implementation of nutritional care management and promotion of physical activity in oncolo patients?

Increasing nurses' willingness to promote nutritional management and physical activity.

57. Would you be willing to increase your current knowledge regarding nutritional management and physical activity in oncology patients?

- ○ Yes
- ○ No

58. Select the educational intervention which you are most likely to participate in from the following:

- [ ] Web-based learning through an online course where lectures may be accessed at your own convenience
- [ ] Video conferencing whereby lectures are conducted in real-time, thereby allowing interaction with the lecturer
- [ ] Attending lectures
- [ ] Job shadowing with dieticians and physiotherapists
- [ ] Other (please specify)

Appendix C: Defintions of relevance ratings as based on those established by Polit and Beck (2010) and Davis (1992)

Measurement of Validity	Definition
I-CVI (item-level content validity index)	The relative amount of experts that provided a question a relevance rating of 3 or 4 where I-CVI = (agreed item)/(number of expert)
S-CVI/Ave (scale-level content validity index based on the average method)	The mean of the obtained I-CVI values for all questions on the scale or the mean of the proportion relevance as provided by all experts. The proportion relevant pertains to the mean of the relevance rating provided by the individual expert. S-CVI/Ave = (sum of I-CVI scores)/(number of item) S-CVI/Ave = (sum of proportion relevance rating)/(number of expert)
S-CVI/UA (scale-level content validity index based on the universal agreement method)	The relative amount of questions on the scale which attain a relevance rating of 3 or 4 by all experts. The Universal Agreement (UA) score is indicated as 1 when the question would have attained 100% experts in concurrence, alternatively a UA score of 0 would be attained. S-CVI/UA = (sum of UA scores)/(number of item)

Appendix D: Relevance ratings on the question scale based on two experts.

	Expert 1	Expert 2		Experts in Agreement	I-CVI	UA
Question number						
Q1	1	1		2	1	1
Q2	1	1		2	1	1
Q3	1	1		2	1	1
Q4	1	1		2	1	1
Q5	1	1		2	1	1
Q6	1	1		2	1	1
Q7	1	1		2	1	1
Q8	1	1		2	1	1
Q9	1	1		2	1	1
Q10	1	1		2	1	1
Q11	1	1		2	1	1
Q12	1	1		2	1	1
Q13	1	1		2	1	1
Q14	1	1		2	1	1
Q15	1	1		2	1	1
Q16	1	1		2	1	1
Q17	1	1		2	1	1
Q18	1	1		2	1	1
Q19	1	1		2	1	1
Q20	1	1		2	1	1
Q21	1	1		2	1	1
Q22	1	1		2	1	1
Q23	1	1		2	1	1
Q24	1	1		2	1	1
Q25	1	1		2	1	1

Q26	1	1		2	1	1
Q27	1	1		2	1	1
Q28	1	1		2	1	1
Q29	1	1		2	1	1
Q30	1	1		2	1	1
Q31	1	1		2	1	1
Q32	1	1		2	1	1
Q33	1	1		2	1	1
Q34	1	1		2	1	1
Q35	1	1		2	1	1
Q36	1	1		2	1	1
Q37	1	1		2	1	1
Q38	1	1		2	1	1
Q39	1	1		2	1	1
Q40	1	1		2	1	1
Q41	1	1		2	1	1
Q42	1	1		2	1	1
Q43	1	1		2	1	1
Q44	1	1		2	1	1
				S-CVI/Ave	1	
Proportion relevance	1	1		**S-CVI/UA**		1
	Average proportion of questions judged as relevance across two experts		1			

Appendix E: Institutional permission for conduction of study from Mater Dei's Chief Executive Officer

L-Università ta' Malta

Mignon Vella <mignon.vella.14@um.edu.mt>

RE: [EXTERNAL] - Request for permission for masters dissertation

CEO at Health-MDH <ceo.mdh@gov.mt> 14 July 2020 at 18:34
To: Mignon Vella <mignon.vella.14@um.edu.mt>

Dear Ms Vella,

Kindly be informed that Ms Celia Falzon has granted approval for you to conduct this study in line with applicable hospital protocols.

Regards

Carmen Farrugia
Personal Assistant To CEO

SPTAR MATER DEI

T +356 25454102

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From: Mignon Vella <mignon.vella.14@um.edu.mt>
Sent: Sunday, 12 July 2020 11:10
To: CEO at Health-MDH <ceo.mdh@gov.mt>
Subject: [EXTERNAL] - Request for permission for masters dissertation

Dear Dr. Falzon,

I hope that this email finds you well. I am a Masters in Nursing student with the University of Malta. As a requirement of the course, I will be carrying out a research study under the supervision of Dr. Danika Marmara. The study is titled: Oncology nurses' attitudes and perceived barriers towards nutritional management and promotion of physical activity in oncology patients.

Through this study, I will be aiming to determine oncology nurses' attitude and behavioural beliefs towards nutritional assessment and management, and promotion of physical activity in oncology patients. Their attitudes towards the significance of their patient's nutritional intake should be explored so as to determine any inconsistencies in what they claim to know and what they actually practice with their patients.

The recruited subjects include all nurses currently practising in the oncology setting. Data will be collected using an online questionnaire, the link to which will be sent to these nurses via an email. An intermediary is also being recruited who will be responsible for disseminating this questionnaire to the oncology nurses. The gathered information will then be stored on my personal computer for the duration of the study and will then be destroyed once the study has been submitted for assessment. Only I will have access to this data for the duration of time in which it is being stored.

The duration of the study will be from the 15th of July 2020, whereby all documents will be submitted for ethical approval, until the 31st of May 2021 whereby the completed dissertation will be submitted. A pilot study will be conducted from the 31st October 2020 till the 7th November 2020, and the questionnaire will be distributed to the subjects from the 14th November 2020 till the 30th November 2020. Therefore, two tests will be conducted at two different moments in time, and participation will include a week for the duration in which the pilot study is being conducted, and for two weeks for the duration in which the questionnaire is being distributed. I will be carrying out this research alone, except for the help of my supervisor.

Attached please find all relevant documents, including my research proposal, approval from SAMOC, information letters, invitation email, clearance from the MDH data protection point of view, permission to use Mr. Mario Hili as an intermediary to my study, permission from Ms. Carmen Damato to proceed with the study, and questionnaire.

Could you kindly provide me with permission to proceed with my study?

Whilst thanking you for your time and consideration, I look forward to your reply.

Kind regards,
Mignon Vella
Staff Nurse
Mob: 79619821

Appendix F: Institutional permission for conduction of study from Mater Dei's Data Protection Officer

L-Università ta' Malta

Mignon Vella <mignon.vella.14@um.edu.mt>

RE: [EXTERNAL] - Request for data protection permission and form

Data Protection at MDH <datapro.mdh@gov.mt> 12 July 2020 at 10:36
To: Mignon Vella <mignon.vella.14@um.edu.mt>
Cc: Young Sharon at Health-MDH <sharon.young@gov.mt>, Data Protection Approval Form at Health-MDH <dpaform.mdh@gov.mt>

Dear Ms Vella

On the basis of the documentation you submitted, from the MDH data protection point of view you have been cleared to proceed with your study titled ***Oncology nurses' attitudes and perceived barriers towards nutritional management and promotion of physical activity in oncology patients*** provided that you obtain approval from MDH CEO (ceo.mdh@gov.mt - please provide the relevant documents including the Chair's approval and this letter).

All data will be provided to you already anonymized since SAMOC staff will reply to the anonymous online questionnaire through the hyperlink.

Anonymisation

The identity of your participants cannot be divulged to anyone by your intermediary not even to academic staff at the UOM.

Consent Criteria

For this study, consent is implied with affirmative action meaning that if participants click on the hyperlink, they will be consenting.

At no point you can be handed contact details of potential participants since these will be approached by your intermediary Mr Mario Hili.

Your intermediary cannot feed Survey Monkey with a list of email addresses otherwise consent would be bypassed. Only a hyperlink through an invitation email can be used.

This clearance does not allow you to communicate with participants since these will only be approached by Mr Mario Hili through the gov email.

Your intermediary must approach participants only through the gov mail since he will be representing SAMOC on your behalf. Personal email accounts must not be used.

This clearance does not cover your intermediary to approach potential participants through social media or any other means. SAMOC clearance is applicable for MDH grounds and not for public domains or any other spheres that are not under MDH's responsibility.

Potential participants for this questionnaire are staff working at SAMOC; not participants or any other public servant who is not under the responsibility of MDH's Data Controller.

Clarifications

This clearance does not cover ethical approval.

This clearance applies only for your questionnaire to be conducted at SAMOC and not at any other institution / department / unit.

What was declared during this clearance process is what you will abide to.

Your submitted documentation and declarations must remain unchanged.

You must abide with all the articles of the GDPR 2016 throughout the data collection process and thereafter.

You are requested to submit a copy of your findings to this office at the end of your study.

Please present this email to Mr Mario Hili.

To sign the data protection form, please contact us through dpaform.mdh@gov.mt *and provide the following:*

- *This clearance email*
- *A copy of the CEO's approval*
- *State the period of data collection*
- *Title of your research*

[Quoted text hidden]

Appendix G: Institutional permission for conduction of study from the Director of Nursing Services

L-Università ta' Malta

Mignon Vella <mignon.vella.14@um.edu.mt>

Re: [EXTERNAL] - Request for permission for Masters Dissetation
1 message

Damato Carmela at Health-MDH <carmela.damato@gov.mt> 10 July 2020 at 20:16
To: Mignon Vella <mignon.vella.14@um.edu.mt>

dear mignon

whilst i wish you further success in your studies you can proceed with your research.

regards
carmen

Sent from my Huawei Mobile

-------- Original Message --------
Subject: [EXTERNAL] - Request for permission for Masters Dissetation
From: Mignon Vella
To: Damato Carmela at Health-MDH
CC:

> Dear Ms. Damato,
>
> I hope that this email finds you well. I am a Masters in Nursing student with the University of Malta. As a requirement of the course, I will be carrying out a research study under the supervision of Dr. Danika Marmara. The study is titled: Oncology nurses' attitudes and perceived barriers towards nutritional management and promotion of physical activity in oncology patients.
>
> Through this study, I will be aiming to determine oncology nurses' attitude and behavioural beliefs towards nutritional assessment and management, and promotion of physical activity in oncology patients. Their attitudes towards the significance of their patient's nutritional intake should be explored so as to determine any inconsistencies in what they claim to know and what they actually practice with their patients.
>
> The recruited subjects include all nurses currently practising in the oncology setting. Data will be collected using an online questionnaire, the link to which will be sent to these nurses via an email. An intermediary is also being recruited who will be responsible for disseminating this questionnaire to the oncology nurses. The gathered information will then be stored on my personal computer for the duration of the study and will then be destroyed once the study has been submitted for assessment. Only I will have access to this data for the duration of time in which it is being stored.
>
> The duration of the study will be from the 15th of July 2020, whereby all documents will be submitted for ethical approval, until the 31st of May 2021 whereby the completed dissertation will be submitted. A pilot study will be conducted from the 31st October 2020 till the 7th November 2020, and the questionnaire will be distributed to the subjects from the 14th November 2020 till the 30th November 2020. Therefore, two tests will be conducted at two different moments in time, and

participation will include a week for the duration in which the pilot study is being conducted, and for two weeks for the duration in which the questionnaire is being distributed. I will be carrying out this research alone, except for the help of my supervisor.

Attached please find all relevant documents, including my research proposal, approval from SAMOC, information letters, consent forms, and questionnaire.

Could you kindly provide me with permission to proceed with my study and use oncology nurses as my subjects?

Whilst thanking you for your time and consideration, I look forward to your reply.

Kind regards,
Mignon Vella
Staff Nurse
Mob: 79619821

Appendix H: Institutional permission for conduction of study from the Senior Nursing Manager at Sir Anthony Mamo Oncology Centre

L-Università ta' Malta

Mignon Vella <mignon.vella.14@um.edu.mt>

RE: [EXTERNAL] - Request to act as intermediary for Masters dissertation data collection

Hili Mario at Health-SAMOC <mario.hili@gov.mt> 12 July 2020 at 07:46
To: Mignon Vella <mignon.vella.14@um.edu.mt>

Dear Ms. Mignon,

I would be willing to be your intermediary to your study.

Regards,

Mario

Mario Hili
Chief Nursing Manager
Administration
Health-Sir Anthony Mamo Oncology Centre

t +356 25452638 e mario.hili@gov.mt
https://health.gov.mt | www.publicservice.gov.mt | fb.com/servizzpubbliku

MINISTRY FOR HEALTH
SIR ANTHONY MAMO ONCOLOGY CENTRE, TRIQ ID-DONATURI TAD-DEMM, MSIDA, MALTA

From: Mignon Vella <mignon.vella.14@um.edu.mt>
Sent: Friday, 10 July 2020 15:35
To: Hili Mario at Health-SAMOC <mario.hili@gov.mt>
Subject: [EXTERNAL] - Request to act as intermediary for Masters dissertation data collection

Dear Mr. Hili,

I hope that this email finds you well. I am a Masters in Nursing student with the University of Malta. As a requirement of the course, I will be carrying out a research study under the supervision of Dr. Danika Marmara. The study is titled: Oncology nurses' attitudes and perceived barriers towards nutritional management and promotion of physical activity in oncology patients.

Through this study, I will be aiming to determine oncology nurses' attitude and behavioural beliefs towards nutritional assessment and management, and promotion of physical activity in oncology patients. Their attitudes towards the significance of their patient's nutritional intake should be explored so as to determine any inconsistencies in what they claim to know and what they actually practice with their patients.

The recruited subjects include all nurses currently practising in the oncology setting. Data will be collected using an online questionnaire, the link to which will be sent to these nurses via an email.

For this reason, I require an intermediary who would distribute an invitation email including a hyperlink to the questionnaire to all nurses currently working in the oncology setting. A pilot study will be conducted from the 31st October 2020 till the 7th November 2020, and the questionnaire will be distributed to the subjects from the 14th November 2020 till the 30th November 2020.

Attached please find all relevant documents, including my research proposal, approval from SAMOC, information letters, consent forms, and questionnaire.

Could I kindly ask you to fulfil this role for the purpose of my study please?

Whilst thanking you for your time and consideration, I look forward to your reply.

Kind regards,
Mignon Vella
Staff Nurse
Mob: 79619821

image001.jpg
24K

Appendix I: Institutional permission for the conduction of study from the Oncology Clinical Chairperson and Quality Assurance Manager achieved through a Sir Anthony Mamo Oncology Centre Oncology Proposal Form

SIR ANTHONY MAMO ONCOLOGY CENTRE

FORM :	**Oncology Proposal/Approval Audit/ Research purposes**
Document Code: ONCO-GeFO-P/A-001. Ver.01	Reference SOP : ONCO-GE-PD.AP--001.Ver.02

Heads of:
(Name, Surname and Section (in block letters) and Signature)

Radiotherapy Department: ***(if applicable)***

Radiography

_____

Medical Physics

_____

Nursing Mario Hili
Chief Nursing Manager
SAMOC

Other SAMOC Departments/ Wards:

_____

_____

Clinical Chairperson (Haematology - Oncology):
Name and Surname (in block letters) and Signature:
N REFALO 3 VII 2020

Quality Assurance Manager:
Name and Surname (in block letters) and Signature:
09/07/2020.

An approval is granted to carry out the study/audit at any SAMOC Department. Patient information can be accessible only by complying with the following data protection principles, which are set out in the Data Protection Act 2001. In summary these state that patient's data shall:

- ***Be obtained and processed fairly and lawfully and shall not be processed unless certain conditions are met. Therefore patient's information (including scans) should be made anonymous by an appointed radiotherapy staff (from the Head of section)***
- ***Be obtained for a specified and lawful purpose and shall not be processed in any manner incompatible with that purpose.***
- ***Be adequate, relevant and not excessive for those purposes (in the case of a study or audit).***
- ***Be accurate and kept up to date.***
- ***Not be kept longer than is necessary for that purpose***
- ***Be processed in accordance with the data subject's rights.***
- ***Be kept safe from unauthorised access, accidental loss or destruction.***
- ***Not be transferred to any third party unlawfully.***

Appendix J: Ethical permission granted by the Faculty of Health Sciences Research Ethics Committee (FREC)

L-Università ta' Malta

Mignon Vella <mignon.vella.14@um.edu.mt>

RE: [EXTERNAL] - UREC FORM V:15062020 6065 - Mignon Vella for FREC review
2 messages

Marmara Danika at Health-SAMOC <danika.marmara@gov.mt> 16 July 2020 at 15:07
To: "research-ethics.healthsci@um.edu.mt" <research-ethics.healthsci@um.edu.mt>
Cc: Mignon Vella <mignon.vella.14@um.edu.mt>

To whom it may concern,

I hereby confirm that the form reflects the contents of the research proposal.

Regards

Dr Danika Marmara' PhD
Director (Cancer Care Pathways)
Cancer Care Pathway
Health-Sir Anthony Mamo Oncology Centre

t +356 25452467 e danika.marmara@gov.mt
https://health.gov.mt | www.publicservice.gov.mt | fb.com/servizzpubbliku

MINISTRY FOR HEALTH
SIR ANTHONY MAMO ONCOLOGY CENTRE, TRIQ ID-DONATURI TAD-DEMM,
MSIDA, MALTA

From: Mignon Vella <mignon.vella.14@um.edu.mt>
Sent: Thursday, 16 July 2020 07:40
To: research-ethics.healthsci@um.edu.mt
Cc: Marmara Danika at Health-SAMOC <danika.marmara@gov.mt>
Subject: [EXTERNAL] - Fwd: UREC FORM V:15062020 6065 - Mignon Vella for FREC review

--------- Forwarded message ---------
From: **Mignon Vella** <mignon.vella.14@um.edu.mt>
Date: Thu, 16 Jul 2020, 07:39
Subject: UREC FORM V:15062020 6065 - Mignon Vella for FREC review
To: <research-ethics.healthsci@um.edu.mt>

--------- Forwarded message ---------
From: **Mignon Vella** <mignon.vella.14@um.edu.mt>
Date: Wed, 15 Jul 2020, 16:12
Subject: UREC FORM V:15062020 6065 - Mignon Vella
To: <form.urec@um.edu.mt>
Cc: Marmara Danika at Health-SAMOC <danika.marmara@gov.mt>

To who it may concern,

Attached please find attached all required documents as requested for FREC application.

Kind regards

Mignon Vella

image001.jpg
24K

Research Ethics HEALTHSCI <research-ethics.healthsci@um.edu.mt> 17 July 2020 at 11:31
To: Marmara Danika at Health-SAMOC <danika.marmara@gov.mt>
Cc: Mignon Vella <mignon.vella.14@um.edu.mt>

Dear Dr Marmara,

Your email was received with thanks.

Sincere Regards,
Christabel

Christabel Vella
FREC Secretary

University of Malta
Faculty of Health Sciences
Room 76, Block A, Level 1
Mater Dei Hospital

https://www.um.edu.mt/healthsciences/students/researchethics

[Quoted text hidden]

Appendix K: Ethical permission granted by the University of Malta Research Ethics Committee (UREC)

UNIQUE FORM ID: 6065_15072020_Mignon Vella

No self-assessment issues ticked. Submitting to FREC for records.

L-Università ta' Malta

ETHICS & DATA PROTECTION

PART 1: APPLICANT AND PROJECT DETAILS

1. Name and surname: Mignon Vella
Email Address: mignon.vella.14@um.edu.mt
2. Applicant status: UM student
3. Faculty: Health Sciences
4. Department: Department of Nursing

If applicable

5. Principal supervisor's name: Dr. Danika Marmara
6. Co-supervisor's name:
7. Name of Degree and Study-unit code: MSc. Nursing
8. Student number:

9. Title of research project: Oncology nurses' attitudes and perceived barriers towards nutritional management and promotion of physical activity in oncology patients.
10. Research question/statement & method: The probability of successfully engaging oncology patients in the adoption of a healthier lifestyle through satisfactory nutritional intake and adequate physical activity is enhanced when oncology nurses engage in active promotion of this lifestyle (Karvinen et al., 2012). While literature is available on nurses' perceptions regarding nutritional management, promotion of physical activity, and any possible barriers to it in hospitalised patients, such as in the studies by Boaz et al. (2013) and Papier et al. (2017), this is limited when pertaining to oncology patients throughout their cancer journey.

A survey conducted through a questionnaire will be used. A random sampling approach will be adopted in this research study. Since the questionnaire was developed for the purpose of conducting the proposed research, the validity and reliability of this tool will be determined by conducting a pilot study, whereby a few questions from each section of the questionnaire will be sent to oncology nurses. The test-retest reliability will be established by sending the questionnaire for a second time, two weeks following the conduction of the pilot study, and the results should demonstrate consistency from the data collected when the questionnaire was initially sent. The questionnaire will be available online, the link to which will be sent via email to all the participants.

The results of the questionnaire will be provided based on a 5 point Likert scale, ranging from 'strongly disagree' (1) to 'strongly agree' (5) in all domains except for the one pertaining to outcome evaluations when measuring attitude. The latter will be presented as a 7 point Likert scale, ranging from 'extremely unimportant' (-3) to 'extremely important (+3).

Since the nature of the research question revolves around an independent and dependent variable which

are both categorical and a distribution curve which is not normal, chi squared tests will be applied in order to determine the relationship between the two variables measured by categories. Data entry and statistical analysis will be performed using SPSS® version 21.0 under direct guidance of an expert statistician. Descriptive and inferential statistics, such as percentages, frequencies, means, standard deviations and confidence intervals, will be used to present basic statistics in relation to socio-demographics, knowledge, perceived barrier variables. Statistical significance will be established at $p < 0.05$ for all analyses.

11. Collection of primary data from human participants?
Yes/Unsure (PLEASE ANSWER NEXT QUESTION)

12. If applicable, explain: A. The total number of nurses currently working in the oncology centre at SAMOC will be asked to participate in the study. The questionnaire will include a section whereby their demographic data will be obtained, including their age, sex, qualifications, and years of practice as a nurse in the oncology setting.

B. Mr. Mario Hili, the senior nursing manager at SAMOC, has been recruited as an intermediary in this study so as to recruit all nurses from all oncology wards.

C. The nurses are required to fill in the questionnaire which will be sent via e-mail by Mr. Mario Hili. A link will be available in this e-mail, which in turn, would redirect the nurses to SurveyMonkey, where they are asked to fill in the questionnaire.

D. A pilot study will be conducted from the 31st October 2020 till the 7th November 2020, and the questionnaire will be distributed to the subjects from the 14th November 2020 till the 30th November 2020.

E. No rewards, inducements or compensation is going to be offered to these nurses.

F. It will aid in enhancing oncology nurses' current knowledge regarding the manner, thereby promoting continuous professional development and enhancing the holistic care which they may provide to their patients.

PART 2: SELF-ASSESSMENT

Human Participants

1. Risk of harm to participants:
2. Physical intervention:
3. Vulnerable participants:
4. Identifiable participants:
5. Special Categories of Personal Data (SCPD):
6. Human tissue/samples:
7. Withheld info assent/consent:
8. Opt-out consent/assent:
9. Deception in data generation:
10. Incidental findings:

UNIQUE FORM ID: 6065_15072020_Mignon Vella

No self-assessment issues ticked. Submitting to FREC for records.

Unpublished secondary data

11. Was the data collected from human participants?
12. Was the data collected from animals?
13. Is written permission from the data controller still to be obtained?

Animals

14. Live animals out of habitat:
15. Live animals, risk of harm:
16. Dead animals, illegal:

General considerations

17. Cooperating institution:
18. Risk to researcher/s:
19. Risk to environment:
20. Commercial sensitivity
21. Other potential risks:

Self-assessment outcome: No self-assessment issues ticked. Submitting to FREC for records.

PART 3: DETAILED ASSESSMENT

1. Risk of harm to participants:
2. Physical intervention on participants:
3. Vulnerable participants:
4. Identifiable participants:
5. Special Categories of Personal Data (sensitive personal data):
6. Collection of human tissue/samples:
7. Withholding information at consent/assent:
8. Opt-out consent/assent:
9. Deception in data generation:
10. Incidental findings:
11. Unpublished secondary data - human participants :
12. Unpublished secondary data - animals:
13. Unpublished secondary data - no written permission from data controller:
14. Lasting harm to animals out of natural habitat:
15. Risk of harm to live animals :
16. Use of non legal animals/tissue:
17. Permission from cooperating institution:
18. Risk to researcher/team:
19. Risk of harm to environment:
20. Commercial sensitivity:

UNIQUE FORM ID: 6065_15072020_Mignon Vella

No self-assessment issues ticked. Submitting to FREC for records.

21. Other issues

- 21a. Dual use and/or misuse:
- 21b. Conflict of Interest:
- 21c. Dual role:
- 21d. Use research tools:
- 21e. Collaboration/data/material collection in low/lower-middle income country:
- 21f. Import/export of records/data/materials/specimens:
- 21g. Harvest of data from social media:
- 21h. Other considerations:

PART 4: SUBMISSION

1. Which FREC are you submitting to? : Health Sciences
2. Attachments: Information and recruitment letter*, Consent forms (adult participants)*, Data collection tools (interview questions, questionnaire etc.), Letter granting institutional approval for access to participants, Institutional approval for access to data, Letter granting institutional approval from person directly responsible for participants
3. Cover note for FREC :
4. Declarations: I hereby confirm having read the University of Malta Research Code of Practice and the University of Malta Research Ethics Review Procedures., I hereby confirm that the answers to the questions above reflect the contents of the research proposal and that the information provided above is truthful., I hereby give consent to the University Research Ethics Committee to process my personal data for the purpose of evaluating my request, audit and other matters related to this application. I understand that I have a right of access to my personal data and to obtain the rectification, erasure or restriction of processing in accordance with data protection law and in particular the General Data Protection Regulation (EU 2016/679, repealing Directive 95/46/EC) and national legislation that implements and further specifies the relevant provisions of said Regulation.
5. Applicant Signature: Mignon Vella
6. Date of submission: 15072020
7. If applicable data collection start date: 31102020
8. E-mail address (Applicant): mignon.vella.14@um.edu.mt
9. E-mail address (Principal supervisor): danika.marmara@gov.mt
10. Conclude: Proceed to Submission

Appendix K: Information email

Information Letter (English)

Oncology nurses' attitudes, beliefs and perceived barriers towards nutritional management and promotion of physical activity in oncology patients.

Dear participant,

This information letter is being distributed for the purpose of clarifying the objectives to be achieved through the conduction of this study, an explanation of your participation in it, as well as your rights as a participant.

Aim of the study

This study is being conducted in order to investigate oncology nurses' knowledge and attitudes, as well as their perceptions regarding why nutritional management and the promotion of physical activity might not be occurring as optimally as possible in the oncology setting. Furthermore, the most effective educational intervention to increase these nurses' willingness to promote these behaviours will also be explored. Therefore, through this research, oncology nurses' behavioural beliefs with regards to the aforementioned target behaviours will be explored, which in turn, will aid to determine how to ensue with the most appropriate and practical method of continuous professional development for oncology nurses. By aiming to overcome their perceived barriers, oncology nurses may then be able to competently provide their patients with the required nutritional care as well as

appropriately promote physical activity in this patient population. As a result, the patients' health-related quality of life will be enhanced. This study will then be presented to the University of Malta as part of my Masters of Science in Nursing under the supervision of Dr. Danika Marmara.

Participation in the study

As a nurse working in the oncology setting, you are being invited to fill in the online questionnaire being distributed to you via e-mail. It should take around ten minutes to complete. Should you encounter any problems in comprehending any questions, kindly contact me on any of the contact information provided below. Your participation in this study is being done on a voluntary basis, and you may choose to not participate in this study. A copy of this information letter may be kept for your perusal. Through the completion of the questionnaire, you are providing consent for your participation in this study. Kindly ensure that the questionnaire has been filled in and submitted by not later than the 30th November 2020.

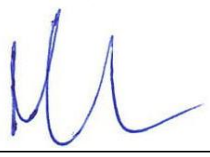
Confidentiality

Your anonymity is ensured as data is immediately input into SurveyMonkey® whereby the received data may not be traced to the e-mail address of that particular participant. However, your IP address may be accessed by this platform. The obtained data will be stored on my personal password protected computer in an encrypted format. Only the researcher will have access to the data which will then be destroyed upon completion and submission of the study.

Benefits and risks

The ultimate benefit to emerge from this study is that of improving the holistic manner in which oncology patients are cared for by providing them with the appropriation nutritional care and informing them as to what physical activity they would prosper from. This aid in improving their health-related quality of life throughout their cancer journey. Furthermore, it will aid in enhancing oncology nurses' current knowledge regarding the manner, thereby promoting continuous professional development. There are no risks involved for the participants. The researcher is knowledgeable regarding the ethical principles that must be applied throughout the conduction of the study so as to safeguard the participants from any potential harm.

Yours sincerely,



Mignon Vella

Researcher

Mob: 79619821

E-mail: mignon.vella.14@um.edu.mt

Dr. Danika Marmara

Research supervisor

Tel: 25452467

E-mail: danika.marmara@gov.mt

Ittra ta’ Informazzjoni (Malti)

L-attitudnijiet tal-infermiera tal-onkoloġija u l-ostakli perċepiti għall-immaniġġjar tan-nutrizzjoni u l-promozzjoni tal-attività fiżika fil-pazjenti tal-onkoloġija.

Għażiż parteċipant,

Din l-ittra ta’ informazzjoni qed titqassam għall-iskop li jiġu ċċarati l-għanijiet li għandhom jinkisbu permezz tat-tmexxija ta’ dan l-istudju, spjegazzjoni tal-parteċipazzjoni tiegħek fiha, kif ukoll id-drittijiet tiegħek bħala parteċipant.

Għan tal-istudju

Dan l-istudju qed isir sabiex jiġu investigati l-għarfien u l-attitudnijiet tal-infermiera tal-onkoloġija, kif ukoll il-perċezzjonijiet tagħhom dwar għaliex l-immaniġġjar tan-nutrizzjoni u l-promozzjoni tal-attività fiżika jistgħu ma jkunux qed iseħħu bl-aħjar mod possibbli fl-ambjent tal-onkoloġija. Barra minn hekk, se jiġi esplorat ukoll l-intervent edukattiv l-aktar effettiv biex tiżdied ir-rieda ta’ dawn l-infermieri li jippromwovu dawn l-imġibiet. Għalhekk, permezz ta’ din ir-riċerka, se jiġi esplorat it-twemmin dwar l-imġiba tal-infirmiera tal-onkoloġija fir-rigward tal-imġiba mmirata, li min-naħa tagħha, se tgħin biex tiddetermina kif wieħed jista’ jsegwi bl-aktar metodu xieraq u prattiku ta’ żvilupp professjonali kontinwu għall-infermiera tal-onkoloġija. Billi jimmiraw li jegħlbu l-ostakli perċepiti tagħhom, l-infermiera tal-onkoloġija mbagħad ikunu jistgħu jipprovdu lill-pazjenti tagħhom

bil-kura tan-nutrizzjoni meħtieġa, kif ukoll jippromwovu b'mod xieraq l-attività fiżika f'din il-popolazzjoni ta' pazjenti. B'riżultat ta' dan, il-kwalità tal-ħajja relatata mas-saħħa tal-pazjenti tkun tista titjieb. Dan l-istudju mbagħad jiġi ppreżentat lill-Università ta' Malta bħala parti mill-Masters of Science in Nursing taħt is-superviżjoni ta' Dr. Danika Marmara.

Parteċipazzjoni fl-istudju

Bħala infermier li taħdem fl-ambjent tal-onkoloġija, inti qed tiġi ġentilment mistieden timla l-kwestjonarju online li qed titqassam lilek permezz tal-e-mail. Għandek tieħu madwar għaxar minuti biex tlestih. Jekk tiltaqa' ma' xi problemi biex tifhem xi mistoqsijiet, tista' tikkuntattjani permezz tal-informazzjoni ta' kuntatt ipprovduta hawn taħt. Il-parteċipazzjoni tiegħek f'dan l-istudju qed issir fuq bażi volontarja, u tista' tagħżel li ma tipparteċipax f' dan l-istudju. Kopja ta 'din l-ittra ta' informazzjoni tista 'tinżamm minnek bħala parteċipant. Meta tlesti il-kwestjonarju, inti qed tipprovdi l-kunsens għall-parteċipazzjoni tiegħek f'dan l-istudju. Jekk jogħġbok, l-kwestjonarju għandu jimtela sa mhux aktar tard mit-30 ta' Novembru 2020.

Konfidenzjalità

L-anonimità tiegħek hija żgurata peress li d-dejta hija immedjatament mdaħħla f' SurveyMonkey® fejn id-dejta li tasal ma tistax tiġi traċċata fl-indirizz tal-e-mail ta' dak il-parteċipant partikolari. Meta tagħfas il-link fl-email li tkun tqassmet, is-sit ta' SurveyMonkey® jista' jkollu aċċess għal-'IP address' tal-kompjuter tiegħek. Id-dejta

miksuba ħa tkun maħżuna b'mod kriptat fuq il-kompjuter personali tar-riċerkatriċi li hu prottett permezz ta' 'password'. Ir-riċerkatriċi biss ħa jkollha aċċess għal din id-dejta li se tinqered malli jitlesta u jiġi sottomess l-istudju.

Benefiċċji u riskji

Il-benefiċċju aħħari li joħroġ minn dan l-istudju huwa dak tat-titjib tal-mod olistiku li bih il-pazjenti tal-onkoloġija jingħataw kura, billi jingħataw il-kura xierqa nutrizzjonali u jiġu infurmati dwar minn liema attività fiżika jistgħu jirnexxu. Din l-għajnuna għat-titjib tal-kwalità tal-ħajja tagħhom relatata mas-saħħa matul il-vjaġġ tal-kanċer tagħhom. Barra minn hekk, se tgħin biex ittejjeb l-għarfien attwali tal-infirmiera tal-onkoloġija, u b'hekk tippromwovi l-iżvilupp professjonali kontinwu. Ma hemm l-ebda riskju involut għall-parteċipanti. Ir-riċerkatur għandu għarfien dwar il-prinċipji etiċi li għandhom jiġu applikati matul it-twettiq tal-istudju sabiex il-parteċipanti jitħarsu minn kwalunkwe ħsara potenzjali.

Dejjem tiegħek,

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