Nurses' Knowledge and Prevalence of Malnutrition Risk in Older Persons within a Maltese Rehabilitation Hospital

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DECLARATION OF AUTHENTICITY

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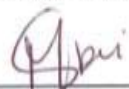
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ABSTRACT

Background   Malnutrition in the older persons admitted into rehabilitation hospitals, has been associated with poor health outcomes for the older persons (Dionyssiotis, Chhetri, Piotrowicz, Gueye & Sánchez, 2017).   Therefore, routine malnutrition screening, to identify older persons at risk of malnutrition is recommended (American Society for Parenteral and Enteral Nutrition (ASPEN), 2011).   Nurses with the right knowledge base on malnutrition in older persons, will help to identify older persons at risk of malnutrition (Bauer, Halfens, & Lohrmann, 2015).   Nurses are required to refer the older person found to be at risk of malnutrition appropriately for an assessment by a dietitian, where a care plan is devised and acted upon.

Aims   The aims of this study were to determine the knowledge on malnutrition in older persons of nurses, working at Karin Grech Rehabilitation Hospital (KGRH). Together with, establishing the prevalence of risk of malnutrition in older persons, upon admission to KGRH.   As well as, determining the referral rate of older persons, found at risk of malnutrition, to the Department of Nutrition and Dietetics (DND) at the same hospital.

Design   A cross-sectional, quantitative research design was employed in this study. Nurses' knowledge on malnutrition in older persons was assessed using the Knowledge of Malnutrition–Geriatric (KoM-G) questionnaire.   The KoM-G was self-administered by 105 nurses working within the wards at KGRH. Content analysis of 150 medical files, of older persons aged 65 years or over, admitted to KGRH over a two-month period was undertaken. This served to collect data on variables of interest regarding the older persons including, whether referred or otherwise to the DND at KGRH and the Mini Nutritional Assessment-Short Form (MNA-SF) score. A score of 0-11 on the MNA-SF was used to determine the prevalence of risk of malnutrition in older persons.

Results   The mean percentage knowledge score of nurses working at KGRH, on malnutrition in older persons was 51.3%. There was no association between the mean percentage knowledge score of nurses and their age, gender, years of nursing experience or highest academic qualification. The prevalence of risk of malnutrition in older persons, upon admission to KGRH stood at 80.7%. There was no association between the older persons' age or gender and their nutritional status. From those identified as at risk of malnutrition, 50.4% were referred to the DND for malnutrition assessment and management. The age, gender or MNA-SF score, of the older persons identified as at risk of malnutrition, were not associated with referral to the DND for malnutrition assessment and management.

Conclusion   A deficit in the knowledge of nurses working at KGRH, on malnutrition in older persons was identified. Moreover, this study recognised that the majority of older persons were at risk of malnutrition upon admission to KGRH. Just over half of those at risk of malnutrition were referred for malnutrition assessment and management. The findings suggest that, changes in clinical practice, updating of polices, education for health care professionals, older persons and their relatives, as well as further research on malnutrition in older persons are warranted.

DEDICATION

This thesis is dedicated to my husband, for his patience and support during the last two years. To our little bundle of joy, Emma. Thank you for understanding that mum had to spend time reading and writing instead of playing with you. To my parents, for encouraging me along the way.

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LIST OF ABBREVIATIONS

ASPEN: American Society for Parenteral and Enteral Nutrition

DND: Department of Nutrition and Dietetics

ESPEN: European Society for Parenteral and Enteral Nutrition

FBBC: Ferguson, Bauer, Banks, Capra

KGRH: Karin Grech Rehabilitation Hospital

MNA: Mini Nutritional Assessment

MNA-SF: Mini Nutritional Assessment – Short Form

MST: Malnutrition Screening Tool

NICE: National Institute for Health and Clinical Excellence

NRS-2002:   Nutrition Risk Screening 2002

NUFFE: Nutrition Form For the Elderly

SGA: Subjective Global Assessment

SNAQ65+:   Short Nutritional Assessment Questionnaire 65+

SNAQRC: Short Nutritional Assessment Questionnaire for Residential Care

WHO: World Health Organisation

OPERATIONAL DEFINITION OF TERMS

Academic qualification: Qualification obtained from a recognised institution.

Cachexia: Progressive loss of skeletal muscle mass, leading to progressive weight loss, in the presence of chronic inflammation (Vanhoutte et al., 2016).

Department of Nutrition and Dietetics: The department where dietitians at Karin Grech Hospital work.

Dietitian: A qualified health professional who assesses, diagnoses and treats dietary and nutritional problems at an individual and wider public health level (British Dietetic Association, 2014).

Donabedian Quality of Care Model: A quality assessment process which proposes that the structures will influence the process which will then have an effect on the outcome (Donabedian, 2002).

Frailty: A state of increased susceptibility of decline in the body's reserves and function, which compromise the ability of the person to cope with the daily or acute episodes of stress (Fried et al., 2001).

Gluconeogenesis: The process where glucose is produced from non-carbohydrate substrates (Chung, Chacko, Sunehag and Haymond, 2015).

Glycogenolysis: The process by which glycogen is broken down to glucose (Chung et al., 2015).

Karin Grech Rehabilitation Hospital: This is a 274-bed hospital, designed to offer inpatient rehabilitation service. The hospital employs an interdisciplinary team, which together with the patients and their carers, aims to maximise the functional abilities of each admitted persons. Persons ten years and over are admitted at KGRH. During the year 2017, there were 1534 new admissions to KGRH, 96.9% of whom were persons aged 60 years or over (Abela, 2017). Malta's acute general hospital, Mater Dei Hospital, was the source of 91.5% of the total admission for 2017. With the majority of the admissions (60.0%) being females and an average length of stay amounting to 55.3 days, during 2017 (Abela, 2017).

Knowledge: Information and understanding about a subject which a person has (Collins English Dictionary, 2018).

Lipolysis: The process of breakdown of lipids by hydrolysis to release fatty acids (Lass, Zimmermann, Oberer and Zechner, 2011).

Malnutrition in older persons: undernourishment, characterised by weight loss and muscle wasting (Chen, Schilling and Lyder, 2001).

Nutritionist: A qualified individual who provides information about food and healthy eating (British Dietetic Association, 2014).

Older person: A person with a chronological age of 65 years or older (WHO, 2002).

Prevalence: The proportion of persons in a population who have a particular disease over a specified period of time (Centers for Disease Control and Prevention, 2017).

Rehabilitation setting/ rehabilitation hospital: Inpatient setting which provides interdisciplinary care, with a focus on recovery of function, to the pre-hospital state, after an illness or a decline in function (van Zwienen-Pot, Visser, Kuijpers, Grimmerink and Kruizenga, 2017).

Risk of malnutrition: A score between 0 and 11 on the Mini Nutritional Assessment – Short Form (MNA-SF) (Nestlé Nutrition Institute, 2009).

Sarcopenia: A generalised skeletal muscle disease. Characterised by low muscle strength and diagnosed by low muscle quantity and quality (Cruz-Jentoft et al., 2018).

Starvation/protein energy malnutrition: Low body fat, muscle mass and weight. It occurs due to a prolonged food deprivation which leads to negative balance in both energy and protein (Mahanta and Tamuli, 2014).

CHAPTER 1
INTRODUCTION

1.1   INTRODUCTION

This chapter will present the general background information upon which this dissertation has been built. It will present the gaps in research which have been identified, as well as, the research aims and questions. This chapter will also outline how this research study was conducted and the significance of this study.

1.2   BACKGROUND INFORMATION

The world is experiencing its first silver tsunami. It is estimated that by the year 2050, the persons aged 60 years and over will double in number, whilst persons living beyond the ninth decade of life will triple (United Nations, 2017). The ageing population is attributed to a substantial increase in life expectancy and a concurrent decrease in birth rate. Malta is no exception, with 138, 019 persons aged 65 years or over, projected to be living in Malta in the year 2050 (Eurostat, 2018). An increase from 18.5% living in Malta in the year 2015, to 26.9% expected to populate the Maltese Islands in the year 2050. An ageing population will present challenges for every country, ranging from housing to economic and from social to health (Stanga, 2009).

The World Health Organisation (WHO) (2018a) reported that the two leading causes of death in Malta in 2016 were, ischaemic heart disease and stroke. Moreover, many other persons, most notably older persons, affected by these conditions survive their illness, though with functional disability (Vos et al., 2016).

A rehabilitation hospital is one which offers an inpatient setting, whereby the focus of the interdisciplinary team is for the persons to recover their physical function, to the pre-hospital state, after an illness or a decline in function (van Zwienen-Pot, Visser, Kuijpers, Grimmerink & Kruizenga, 2017). Many older persons affected by a debilitating condition, such as a stroke, will need to improve their function, in a rehabilitation hospital. This will increase the chances that the older persons will be discharged back to their own home. Thus, achieving the global move towards ageing in place and ageing well (Araujo de Carvalho et al., 2017). Given that the number of older persons will continue to

increase, rehabilitation hospitals will increase in importance (Handoll, Cameron, Finnegan, & Langhorne, 2009; Nicosia et al., 2012).

Regrettably, various studies showed that many older persons, when admitted to hospital, had an increased risk of malnutrition or were malnourished (Bavelaar, Otter, van Bodegraven, Thijs & van Bokhorst-de van der Schueren, 2008; Hoffer, 2001; Kubrak & Jensen, 2007).

The researcher's interest in the topic of malnutrition in older persons stemmed from her experience of working for over fifteen years in Maltese hospitals, at times coming face to face with older persons who looked overly thin. The researcher retrieved only two studies which investigated the prevalence of malnutrition in older persons in Malta. However, no data was retrieved on the prevalence of malnutrition risk in older persons, upon admission to a rehabilitation hospital. This study was intended to fill this lacuna. Together with, exploring the knowledge base of nurses, working in the same rehabilitation hospital, on malnutrition in older persons.

1.3   MALNUTRITION AND REHABILITATION OUTCOME

Malnutrition is a broad terminology (Barker, Gout & Crowe, 2011). Throughout this study, the definition by Chen, Schilling and Lyder (2001), for malnutrition in older persons, will be used. They defined malnutrition in older persons as, undernourishment, characterised by weight loss and muscle wasting.

Plethora of literature discussed the risk factors and consequences of malnutrition in a hospitalised person. Studies indicated a negative correlation between a malnourished state and health outcomes including, prolonged hospital stay, increased morbidity and mortality (Agarwal et al., 2013a; Marshall, Bauer & Isenring, 2014; Slattery, Wegener, James, Stanek & Miller, 2015). Moreover, in the rehabilitation setting, being malnourished or at risk of malnutrition was positively correlated with poor participation

in rehabilitative therapies (Slattery et al., 2015). This in turn led to negative rehabilitation outcomes (Neumann, Miller, Daniels & Crotty, 2005; Slattery et al., 2015).

Considering the consequences of malnutrition, identifying the persons who are at risk of becoming, or are already malnourished, is of paramount importance (Barker et al., 2011; Yaxley, Crotty & Miller, 2015). This is achieved through nutrition screening and nutrition assessment.

1.4 PREVALENCE OF RISK OF MALNUTRITION IN REHABILITATION

Interesting to note is that malnutrition has been shown to be more prevalent in the rehabilitation setting than in any other care setting, including acute setting (Compan, Di Castri, Plaze & Arnaud-Battandier, 1999; Watterson et al., 2009). Charlton et al. (2010) through their large, cross sectional study, calculated a prevalence of risk of malnutrition in persons aged 65 years or older, admitted in a rehabilitation hospital of 91.9%.

Despite rehabilitation being cited as a critical area to be researched (Beck et al., 2001), studies on the prevalence of risk of malnutrition in rehabilitation hospitals are limited (Charlton et al., 2010; Hertroijs et al., 2012; van Zwienen-Pot et al., 2017). Especially when the older persons are taken as the target population (Neumann et al., 2005; Walton, Williams, Tapsell, & Batterham, 2007). An older person, being defined throughout this study as a person with a chronological age of 65 years or older (WHO, 2002).

In Malta, there is a dearth of literature on the prevalence of risk of malnutrition in older persons, upon admission to a rehabilitation hospital. As Velasco-Rodriguez et al. (2015) recommended, it is important to establish this prevalence in different populations so that recommendations specific to the particular populations can be made.

1.5   REFERRAL TO DIETITIAN

In the limited number of international studies, the risk of malnutrition in older persons, upon admission to a rehabilitation hospital was reported to be high (Beck et al. 2001; Charlton et al. 2010; Kaiser et al. 2011; Shiraishi, Yoshimura, Wakabayash & Tsuji, 2017).   Moreover, studies and systematic reviews established that malnutrition is frequently unrecognised and under treated (Bavelaar et al., 2008; Correia et al., 2016; Sharma et al., 2016). To improve this situation, various organisations recommended that all persons admitted to a hospital should be screened for malnutrition risk (American Society for Parenteral and Enteral Nutrition (ASPEN), 2011; European Society for Parenteral and Enteral Nutrition (ESPEN), 2003; National Institute for Health and Clinical Excellence (NICE), 2006).

When a person, through malnutrition screening is found at risk of malnutrition, the subsequent crucial process is to refer the person to a dietitian for malnutrition assessment and management. However, a Cochrane review found that medical staff, many a time fail to undertake this step (Omidvari, Vali, Murray, Wonderling & Rashidian, 2013).

Studies investigating the referral rate to the dietitian, of older persons found to be at risk of malnutrition, upon admission to a rehabilitation hospital are limited (Neumann et al., 2005). One such study established that the referral rate amounted to 42.0% of persons at risk of malnutrition (Neumann et al., 2005). Regrettably, this study had strict selection criteria, which meant that many older persons were excluded from participating in the study, limiting the generalisability of the findings.

1.6   NURSES' KNOWLEDGE ON MALNUTRITION IN OLDER PERSONS

Nurses have been identified as the professionals who are best positioned to undertake nutritional screening and initiate the nutrition care pathway (Crogan, Shultz & Massey, 2001; Kim & Choue, 2009). To do this, they need to have sufficient nutritional knowledge to recognise the risk factors of malnutrition (Endevelt, Werner, Goldman & Karpati, 2009).

Research assessing the level of knowledge of nurses regarding nutrition in the older person is sparse (Beattie, O'Reilly, Stange, Franklin & Isenring, 2013; Endevelt et al., 2009). Especially, if one focuses solely on malnutrition. Whilst some studies indicated that nurses had good knowledge on nutrition (Endevelt et al., 2009; Theilla, Cohen, Singer, Liebman & Kagan, 2016), others indicated poor to average knowledge (Bauer, Halfens & Lohrmann, 2015; Beattie et al., 2013; Boaz et al., 2013). From the few number of studies located on the topic of nurses' knowledge on malnutrition in the older person, none of them focused on nurses working in a rehabilitation hospital.

1.7 AIMS OF THE STUDY

This study intended to narrow the aforementioned gap in the knowledge on malnutrition in Malta, by establishing the:

1. Knowledge base of nurses working in a rehabilitation hospital on malnutrition in the older persons.
2. Prevalence of risk of malnutrition in older persons, upon admission to a rehabilitation hospital.
3. Referral rate of older persons identified as at risk of malnutrition, to the Department of Nutrition and Dietetics (DND) for assessment and management of malnutrition.

1.8 RESEARCH QUESTIONS

Specifically, this study sought to answer the following questions, which stemmed from the aims of the research study:

1. What is the knowledge of nurses, working in a Maltese rehabilitation hospital, on malnutrition in the older persons?
2. What is the prevalence of malnutrition risk in older persons, upon admission to a Maltese rehabilitation hospital?
3. What is the referral rate to the DND, for malnutrition assessment and management, of older persons identified as at risk of malnutrition, upon admission to the rehabilitation hospital?

1.9   RESEARCH DESIGN

To answer the above mentioned questions and since the study followed a realist's viewpoint of the world, a quantitative research design was deemed the better option. The study was divided into two parts. The first part, involved nurses working within a Maltese rehabilitation hospital to compile a self-administered questionnaire, on malnutrition in older persons. They also provided data on their age, gender, years of nursing experience and highest academic qualification.

In the second part of the study, the researcher, conducted content analysis of the medical files of older persons, aged 65 years or over, who were admitted over a 2-month period, to the same Maltese rehabilitation hospital. The data collected consisted of the Mini Nutritional Assessment-Short Form (MNA-SF) score, the age, the gender and whether or not the older persons were referred for malnutrition assessment and management, to the DND of the same hospital.

The collected quantitative data was used to test null hypotheses which emanated from the research questions. This was achieved through the use of various statistical tests and results displayed in figures and tables.

1.10   SIGNIFICANCE OF THE STUDY

It is believed that this study will offer a valuable contribution to the international literature, by helping to narrow the knowledge gap on the topic of malnutrition in the older persons in Malta. Additionally, the findings from this study can be used as baseline data against which future studies could be compared.

1.11   CHAPTER SUMMARY

This chapter outlined the importance of rehabilitation hospitals, to aid the ever increasing number of older persons, who would need specialised care to recuperate their physical function. Studies indicated that there is high prevalence of malnutrition in older persons,

upon their admission into a rehabilitation hospital (Kaiser et al. 2011; Shiraishi et al. 2017; Wakabayashi & Sashika, 2014). This could jeopardise the older persons' rehabilitation outcome (Slattery et al., 2015). Thus, early identification and management of the nutritional status of older persons at risks of malnutrition is of utmost importance.

Nurses have been pinpointed as having an important task of identifying older persons at risk of malnutrition and referring them to the dietitian for further malnutrition assessment and management (Kim & Choue, 2009). To do so, it is paramount that nurses have the necessary knowledge to identify persons at risk of malnutrition. However, this is at times lacking.

Gaps in knowledge were identified mainly, the knowledge base of nurses working in a Maltese rehabilitation hospital, on malnutrition in the older persons. As well as the prevalence of risk of malnutrition, of older persons upon their admission into a Maltese rehabilitation hospital. This study sought to reduce this gap in knowledge through a quantitative research design.

1.11.1   Subsequent Chapters

This dissertation consists of six chapters. Chapter two explores in depth the literature on malnutrition in older persons and the nurses' knowledge on malnutrition. Chapter three outlines the methodology followed to conduct this study, whilst chapter four illustrates the findings obtained from the data analysis. This is followed by chapter five, which discusses and compares the findings of this study with similar international studies. It also looks at the limitations present in this study. This dissertation ends with chapter six, the conclusion, where a summary of the study is given, together with recommendations for practice, research and policy development.

CHAPTER 2
LITERATURE REVIEW

2.1 INTRODUCTION

In this chapter, the main themes surrounding the topic of malnutrition will be discussed. These will include an exploration of the definition of malnutrition, the aetiology of malnutrition as well as the contributing factors and consequences to it. The literature review will also discuss the difference between a diagnosis of malnourishment versus being at risk of malnutrition. A discussion and critique of studies which focused on determining the prevalence rate of risk of malnutrition will follow. Studies investigating the referral rate to the dietitian of older persons at risk of malnutrition for assessment and management will also be explored. As well as studies focusing on the benefits of nutrition therapy in malnourished persons and the role of the nurses in identifying persons at risk of malnutrition. The limited number of studies on the knowledge of nurses on nutrition in older persons will be referred to and critiqued towards the end of this chapter.

2.2 MALNUTRITION IN OLDER PERSONS

Defining malnutrition remains a debatable subject (Correia, Perman & Waitzberg, 2017) and as yet there is no universally accepted definition for it (Agarwal, Miller, Yaxley, & Isenring, 2013b; Bauer, Kaiser, & Sieber, 2010; Cant, 2010; Löser, 2010). Various definitions have been put forward for the term malnutrition. Definitions by ASPEN (2011), Barker et al. (2011), Green and Watson (2005), Stratton, Green & Elia (2003) and the WHO (2018b), were more generic in comparison to the ones proposed by Chen et al. (2001), Dionyssiotis, Chhetri, Piotrowicz, Gueye and Sánchez (2017), Hoffer (2001), Norman, Pichard, Lochs and Pirlich (2008) and Skipper (2012). The former stated that malnutrition is an imbalance between the energy and nutrients needed by the body, for normal growth, maintenance and function, in contrast to the energy and nutrients supplied and utilized by the body. Whilst the latter authors, defined malnutrition as a state of nutrient deficiency, resulting from inadequate intake or inability to appropriately digest and absorb nutrients.

Notwithstanding the array of malnutrition definitions, Chen et al. (2001) took a stand and defined malnutrition in older persons as, undernourishment, which leads to weight loss and muscle wasting. The definition by Chen et al. (2001) contrasts the other proposed

definitions by being specific for older persons (Table 2.1). It also allowed malnutrition to be measured through anthropometric means. Thus, making diagnosis of malnutrition easier and objective. Having a definition for malnutrition in older persons offers a level platform for research and literature on this topic.

Table 2.1:   **Comparison of different definitions of malnutrition.**

Author	Definition of Malnutrition
ASPEN (2011), Barker et al. (2011), Green and Watson (2005),Stratton et al. (2003), WHO (2018b)	• An imbalance between the energy and nutrients needed by the body. • Could be over and under nutrition. • For the general population.
Dionyssiotis et al. (2017), Hoffer (2001), Norman et al. (2008), Skipper (2012),	• Nutrient deficiency leading to undernutrition. • Not specific for the older person.
Chen et al. (2001)	• *Undernourishment, leading to weight loss and muscle wasting.* • *Specific for the older person.*

As this study will focus on malnutrition risk in the older persons, the definition for malnutrition by Chen et al. (2001) was deemed to be the best fit. Hence, it will be used as the definition for malnutrition in older persons throughout this study.

2.2.1 Weight Changes with Age

When a person approaches the fifth decade in life, there is a tendency that weight contributed by fat free mass, which includes muscles, organ tissue and bone mass, will start declining. Contrary to this, the fat mass will increase, especially abdominal fat. This upward trend in accumulation of fat continues until a person reaches the mid-seventies (Stanga, 2009). With age above 70 years, a normal physiological decrease in weight amounting up to 0.2kg per year is noticed (Stanga, 2009). Therefore, normal physiological changes that occur with advanced age, do not lead to substantial loss in weight. Hence, any excess weight loss can be attributed to malnutrition (Wallace & Schwartz, 2002).

2.2.2 The Aetiology of Malnutrition

Sarcopenia, cachexia and starvation, which conditions are characterised by muscle wasting and weight loss are indicated as the aetiology bases for malnutrition (Chapman, 2011; ESPEN; 2017; Hickson, 2006; Thomas, 2007). Moreover, Wakabayashi and Sashika (2014) specified that malnutrition could have more than one aetiology at any given time.

Sarcopenia has been coined relatively recently. Cruz-Jentoft et al. (2018) defined sarcopenia as generalised skeletal muscle disease, characterised by low muscle strength and diagnosed by low muscle quantity and quality. Cruz-Jentoft et al. (2018) pointed out that an inability to meet the energy and protein needs is associated with the development of sarcopenia.

Cachexia, is associated with illnesses such as, cancer, rheumatoid arthritis, congestive heart failure and chronic infections. These illnesses will cause an immune response, with the production of cytokines, leading to an elevated basal metabolic rate. This results in muscle wasting and loss in body weight (Bauer et al., 2006; Vanhoutte et al., 2016). Experts believe that increasing the nutrient intake to cater for the elevated basal metabolic rate can positively influence the pathogenesis of cachexia. Nonetheless, such an intervention, without addressing the underlying illness would not suffice to correct malnutrition (Isenring & Teleni, 2013).

Starvation/protein energy malnutrition occurs due to prolonged food deprivation, resulting in negative energy and protein intake, compared to requirements. The body will resort to glycogenolysis, lipolysis and eventually gluconeogenesis for energy production (refer to operational definition of terms). These processes will decrease fat, muscle mass as well as weight (Mahanta & Tamuli, 2014; Thomas, 2007).

2.2.3 Contributing Factors to Malnutrition

Numerous studies identified factors which compromise oral nutritional intake, thus increasing the risk of developing malnutrition (Amaral et al., 2010; Daniels, 2003; Mudge Ross, Young, Isenring, & Banks, 2011). These factors could be categorised into physiological factors, personal and social factors, psychological factors and healthcare system factors (Table 2.2).

Many of the listed contributing factors, including dementia, poor dentition and changes in taste and smell, mostly occur in older persons rather than in younger ones. Moreover, older persons can have multiple contributing factors present concurrently (Stratton et al., 2003). These make the older persons much more prone to increased risk of malnutrition when compared to other age groups (Stratton et al., 2003).

Table 2.2: Studies showing factors which could lead to malnutrition.

Factor type	Affect	Study
Physiological Factors	Disease specific, including inability to ingest, digest, absorb, transport or utilise nutrients or having nutrient losses	Roberts, Kennerly, Keane & George (2003); White et al. (2012)
	Elevated nutritional needs	Mudge et al. (2011)
	Poor appetite	Agarwal et al. (2013b)
	Decreased food intake	Agarwal et al. (2013b)
	Early satiety	Daniels (2003)
	Pain	Daniels (2003)
	Decreased hunger	Morley (1997)
	Constipation	Asai (2004)
	Poor dentition, poor oral health	Agarwal et al. (2013a); Asai (2004)
	Taste and olfactory changes	Kubrack & Jensen (2007)
	Dysphagia	Hiesmayr et al. (2009)
	Poor dexterity	Rosenthal (2004)
Personal and Social Factors	Dissatisfaction with food served	Norman et al. (2008)
	Limited finances	Morley (1997)
	Inability to prepare food	Rosenthal (2004)
Psychological Factors	Dementia	Asai (2004)
	Delirium	Mudge et al. (2011)
	Low mood	Kubrack & Jensen (2007)
Healthcare system Factors	Inflexible mealtimes	Kondrup et al. (2002)
	Difficulty to access food/open packages	Kubrack & Jensen (2007)
	Poor menu including lack of variety and unappealing meals	Mudge et al. (2011)
	Interruptions during meal times	Mudge et al. (2011)
	Lack of assistance for feeding	Mudge et al, (2011)
	Poor ward ambiance	Nieuwenhuizen, Weenan & Rigby (2010)
	Polypharmacy	Amaral et al. (2010)
	Prolonged nil-by-mouth status	Hickson (2006)

2.2.4 Impact of Malnutrition

The ill effects of malnutrition have been studied in depth (Barker et al., 2011; Löser, 2010), but there is a dearth of research exploring such consequence in older persons admitted for rehabilitation (Slattery et al. 2015). Nevertheless, Dionyssiotis et al. (2017) commented that the prognosis of a malnourished person in the rehabilitation setting is established. Such that these persons, as could be seen in Table 2.3, have a worse outcome than well-nourished counterparts.

Table 2.3: **Studies showing the consequences of malnutrition in older persons undergoing rehabilitation.**

Consequences of malnutrition	Country	Study
Longer length of stay	Australia	Neumann et al. (2005)
	Australia	Charlton et al. (2012)
	Australia	Marshall, Young, Bauer & Isenring (2016)
	Australia	Slattery et al. (2015)
Poor function	Australia	Neumann et al. (2005)
	Japan	Wakabayashi & Sashika (2014)
	Australia	Slattery et al. (2015)
Poor quality of life	Australia	Neumann et al. (2005)
Discharged to a higher level of care	Australia	Visvanathan, Penhall & Chapman (2004)
	Australia	Neumann et al. (2005)
	Australia	Charlton et al. (2012)
Poor participation in therapy	Australia	Slattery et al. (2015)
Higher mortality at 26 months post discharge	Australia	Charlton et al. (2012)

These studies need to be interpreted with caution since none of them was a clinical trial, which is understandable, owing to the ethical issues involved. As such, it is difficult to definitely conclude that the negative outcomes were solely due to malnutrition. However, when one considers that the above mentioned studies (a) were conducted across different

parts of the world, (b) involved large number of persons, (c) were conducted by different researchers and (d) point to similar results; these give a good base to the premise that, malnutrition leads to worse health outcomes and can hinder rehabilitation in older persons.

In a meta-analysis, involving 1220 older persons admitted for rehabilitation, Marshall et al. (2014) concluded that persons who were malnourished exhibited (a) longer periods towards functional recovery, (b) poor quality of life and (c) increased likelihood towards discharge to residential care. The limitation of this meta-analysis was that the diagnosis criteria of malnutrition was not the same across the studies. Additionally, one of the five studies included in the review used a screening test for malnutrition, rather than a diagnostic tool for malnutrition. Moreover, the time when assessment of malnutrition in the older persons took place, was different across the studies (Table 2.4). These led to heterogeneity in the studies and compromised the conclusion of the review.

Table 2.4: **Characteristics of the studies included in the meta-analysis by Marshall et al. (2014).**

Study	Country	Assessment method	Time of assessment
Charlton et al. (2012)	Australia	MNA	26 months post discharge
Neumann et al. (2005)	Australia	MNA	90 days post baseline assessment
Nicosia et al. (2012)	Italy	MNA-SF	2 years from baseline assessment
Sullivan, Walls, & Lipschitz (1991)	America	SGA	1 year post discharge
Visvanathan et al. (2004)	Australia	MNA	Immediate post discharge

2.3   BENEFITS OF NUTRITION INTERVENTION

On a positive note, a Cochrane review, involving 62 randomised controlled trials with a total of 10,187 hospitalised older persons, indicated that nutrient supplementation in

malnourished older persons, produced increased weight gain, decreased mortality and led to less medical complications (Milne, Potter, Vivanti & Avenell, 2009). However, this review did not involve persons undergoing rehabilitation. Individual studies also indicated that nutrition intervention in malnourished persons was associated with decreased length of hospital stay (Holyday et al, 2012; Stratton et al., 2003).

Studies which investigated the benefits of nutrition intervention in malnourished older persons undergoing rehabilitation are limited in number. These studies indicated positive outcomes from nutrition intervention (Stanga, 2009). Asai (2004) and Wakabayashi & Sakuma (2014) in their review articles concluded that, nutrition intervention increased participation in rehabilitation and improved the persons' overall health outcomes. Whilst recently, Yoshimura, Uchida, Jeong and Yamaga (2016) in their small scale, randomized control trial, involving 39 malnourished older persons undergoing rehabilitation, nutrition intervention with physiotherapy, led to a significant improvement in activities of daily living. This when compared to the control group who was involved only in physiotherapy. This study had its own limitations, most notably the small number of participants and the bias that other co-morbidities and disabilities, which could have affected the functional outcome from rehabilitation, were not accounted for.

2.4   MALNUTRITION ASSESSMENT

As mentioned above, substantial body of evidence indicate the ill-effects that malnutrition may pose on older persons and the benefits which nutrition intervention brings about. To implement a nutritional care process for persons at risk of malnutrition or malnourished, identification of these persons is warranted. Owing to the different aetiologies of malnutrition, diagnosis is generally based on objective observations such as, low appetite, decreased food intake and various anthropometric and biochemical markers (Pablo, Izag & Alday, 2003). However, no one measure has been found to be a good enough standalone assessment method to diagnose malnutrition (Agarwal et al., 2013b).

Consequently, assessment tools were developed, which incorporate different measurements. The Subjective Global Assessment (Detsky et al., 1987) is the most cited assessment tool. Besides this, societies including the ESPEN (2017) and the ASPEN (2012) proposed their own diagnostic criteria for malnutrition. As such, Marshall (2016), concluded that there is no gold standard to diagnose malnutrition. Both assessment tools and diagnostic criteria for malnutrition carry their own limitations. Including, being time consuming as well as the assessor would need to be specifically trained on their use (Agarwal et al., 2013b). For these reasons, they are to be used after a person is identified as at risk of malnutrition, to assess and diagnose if the person is malnourished or not (Jensen, Hsiao & Wheeler, 2012).

2.5 SCREENING FOR MALNUTRION RISK

Nutrition screening will identify persons who are already malnourished or at risk of becoming malnourished, but screening does not diagnose malnutrition (de Ulíbarri Pérez, Fernández, Rodríguez Salvanés, & Díaz López, 2014). Nutrition screening is recommended by the ASPEN (2011), ESPEN (2003), and NICE (2006), to be done rigorously upon admission of a person to hospital, using a validated tool, which is appropriate for the particular population upon which it is applied (Yaxley et al., 2015). When a person is identified to be at risk of malnutrition, the person needs to be referred to a dietitian. The dietitian will assess the person for malnutrition and devise the appropriate nutrition intervention (ASPEN, 2011; ESPEN, 2002; NICE, 2006).

For the purpose of nutrition screening, various screening tools have been developed, which include the Malnutrition Screening Tool (MST), the Nutrition Risk Screening 2002 (NRS-2002) and the Mini Nutritional Assessment – Short Form (MNA-SF). The MNA-SF was specifically developed for the older population and has been proved to be both reliable and valid in various settings. As such, it has been endorsed by ESPEN (2003) to be used as a malnutrition screening tool for the older population in the hospital, community and elderly care residences. Moreover, this screening tool is probably the most broadly used to screen for malnutrition in older persons (Dionyssiotis et al., 2017).

At times, in literature the terms nutritional assessment and nutritional screening are used interchangeably (Green & Watson, 2005). This leads to confusion in deciding if the study was actually looking at prevalence of malnutrition or the risk of it. To complicate matters further, the 2009 revised version of the MNA-SF, divided older persons at risk of malnutrition (MNA-SF score 0-11) into two categories, to denote the level of risk of malnutrition. These two categories are termed 'malnourished' (MNA-SF 0-7) and 'at risk of malnutrition' (MNA-SF 8-11). With older persons scoring lower on the MNA-SF having the highest risk of malnutrition. As the MNA-SF is a screening tool for malnutrition, it determines the risk of malnutrition, but cannot diagnose malnutrition (Barker et al., 2011; Marshall, 2016). Thus, the MNA-SF category for the older persons who are most at risk of malnutrition termed as 'malnourished' is misleading (Cascio & Logomarsino, 2018).

2.6   PREVALENCE OF MALNUTRITION

Malnutrition in older persons is found across all the healthcare continuum, from community setting to acute hospitals and rehabilitation hospitals to residential care (Sauer, Alish, Strausbaugh, West & Quatrara, 2016).

Table 2.5 summarises the findings from two studies which investigated the prevalence of malnutrition in older persons across different settings. Both Beck et al. (2001) and Kaiser et al. (2011) found a statistically significant higher prevalence of malnutrition in older persons admitted in a rehabilitation hospital, when compared to other health care settings. The limitation in the study by Beck et al. (2001) was that older persons living with dementia and those who had communication difficulties, were excluded from participating in the study. As these two conditions increase the risk of lower oral intake, the prevalence of malnutrition could potentially be higher, were the inclusion criteria be less stringent. Moreover, the 0% prevalence of malnutrition in the community setting seen in the study by Kaiser et al. (2011), could be attributed to the recruitment method. As these older persons contacted the study team themselves, following an advert on the newspaper and general practitioners' office, they could have been more health conscious

and healthier, than non-participants. This could have led to a low prevalence of malnutrition.

Table 2.5: **Studies showing the prevalence (%) of malnutrition across different health care settings.**

Author	Country	Community (%)	Acute wards (%)	Nursing home(%)	Rehabilitation (%)
Beck et al. (2001)	Australia	NI	9.0	NI	49.0
Kaiser et al. (2011)	Germany	0	NI	18.1	40.8

NI: Not Investigated

These two individual studies support the meta-analysis by Kaiser et al. (2010). These researchers investigated the difference in prevalence of malnutrition in persons aged 65 years or over, across the healthcare continuum. The researchers retrospectively analysed data of 4,507 older persons, who participated in 24 studies. The results showed that malnutrition in older persons was least prevalent in the community (5.8%), followed by nursing homes (13.8%) and acute hospitals (38.7%). With the highest prevalence of malnutrition being in older persons admitted in rehabilitation hospitals (50.5%) (Table 2.6).

Table 2.6: **Prevalence of malnutrition across the health care continuum as calculated by Kaiser et al. (2010).**

Setting	Prevalence of Malnutrition (%)
Community	5.8
Acute Hospitals	38.7
Rehabilitation Hospitals	50.5
Nursing Homes	13.8

However, in the above meta-analysis, it is worth noting that the different settings did not have equal representation of older persons. With only 345 older persons in the rehabilitation hospitals being included in the pooled data, versus over 1,300 in the acute

hospital. In addition, the varying characteristics of the different settings between countries, potentially also affected the results.

The findings by Kaiser et al. (2010) pointed towards an increase in prevalence of malnutrition as the older persons' dependency on care increased. This result is not surprising since older persons who are hospitalised, versus those living in the community, are exposed to a greater array of the previously mentioned physiological factors (Table 2.2), which hinder nutritional intake. The worse prevalence of malnutrition (50.5%) within the rehabilitation setting could potentially be due to the fact that most of these older persons hailed from an acute hospital setting (Beck et al., 2001). Where the older persons' nutritional status could have deteriorated even further during their acute hospitalisation. This potentially due to healthcare system factors (Table 2.2) such as, prolonged hours of fasting to undergo medical investigations (Hickson, 2006) and inappropriate feeding times (Kondrup et al., 2002).

2.7   MALNUTRITION IN MALTESE OLDER PERSONS

Two retrieved studies investigated the prevalence of malnutrition in older persons in Malta. The first conducted by Koh in 2004. He set to determine the prevalence of malnutrition in persons' aged 65 years or over, living at St Vincent de Paul Residence, the largest residential care setting in Malta. At the time, 1,027 persons lived in this residence. This study recruited 42 older persons, via a convenience sample. The convenience sampling and small sample size limited the generalisability of this study.

Older persons (a) on non-oral feeds, (b) unable to give informed consent, (c) who were fasting (d) those severely ill or (e) who were having in between meal snacks, were excluded from the study. These exclusion criteria could have potentially skewed the end results, as the excluded factors contribute towards an increased risk of malnutrition. However, persons living with dementia, and capable of giving informed consent, were included in the study. Dementia was identified by Asai (2004), as being a risk factor for increased risk of malnutrition.

Koh (2004) established a prevalence rate of malnutrition of 9.5% and a prevalence of risk for malnutrition of 71.5%. When compared to the meta-analysis by Kaiser et al. (2010), who established a prevalence of malnutrition in nursing homes of 13.8%, the prevalence of malnutrition in older persons in the study by Koh (2004) was small. As mentioned above, this could be due to the non-representative sample of participants and the tight inclusion and exclusion criteria used, tending to exclude older persons at high risk of malnutrition.

The second local study which investigated the prevalence of malnutrition in older persons in Malta was conducted by Zammit (2009). He recruited 50 persons aged 65 years or over using quota sampling, from all the acute medical wards within the general hospital. The aim of this study was to determine the prevalence of malnutrition of older persons within 72 hours of their admission into a medical ward.

Given the time lag from admission to when the older persons were assessed for malnutrition, healthcare factors (refer to Table 2.2), such as inflexible meal times, could have already left some negative effect on the older persons' nutritional status. Similar to the study by Koh (2004), persons (a) on non-oral nutrition, (b) severely unwell or (c) unable to consent/did not have a carer to consent on their behalf, were excluded from participating in this study.

The results by Zammit (2009) showed that 38.0% of the older persons who participated in the study were malnourished and an additional 30.0% were at risk of malnutrition. Zammit's (2009) results were similar to the meta-analysis by Kaiser et al. (2010), who established the prevalence of malnutrition in older persons in an acute setting at 38.7%.

2.8 PREVALENCE OF RISK OF MALNUTRITION

It is clear from international and local studies that the prevalence of malnutrition is highest within the rehabilitation setting. When one looks at the prevalence of the risk of

malnutrition in this setting, the situation is even worse. With most of the retrieved studies (Table 2.7) quoting a prevalence of risk of malnutrition greater than 78.0%.

Comparing the results between different studies is an arduous task because different studies employed different criteria (Banks, Ash, Bauer & Gaskill, 2007). Whilst most studies adhered to the 65 years or over age bracket, when defining older persons, Sánchez-Rodríguez et al. (2017) explored malnutrition in persons 70 years or over. Since studies highlighted the significant increase in malnutrition with increasing age (Agarwal et al., 2012; Dominguez, 2013; Kettell, Kyle, Itsiopoulos, Naunton & Luff, 2016; Lazarus & Hamlyn, 2005; Söderhamn, Bachrach-Lindström, & Ek, 2007; Vanderwee et al., 2011; Velasco-Rodriguez et al. 2015; Wakabayashi & Sashika, 2014), this could account for the higher prevalence of risk of malnutrition in the study by Sánchez-Rodríguez et al. (2017).

Whilst Beck et al. (2011) did not define the age of the participants, 269 persons from the 366 persons who participated in the study by Hertroijs et al. (2012), were below the age of 65 years. Age could have accounted for the lower prevalence rate of risk of malnutrition in the study by Hertroijs et al. (2012), when compared to the other studies. Moreover, some of the malnutrition screening tools used by Hertroijs et al. (2012) (MNA-SF, SNAQ65+, SNAQRC) have only been validated to be used in older persons aged 65 years or over. As the screening tools were used outside their intended scope, this could potentially have led to erroneous prevalence rate of risk of malnutrition.

Table 2.7: Studies investigating the prevalence of risk of malnutrition in older persons admitted in a rehabilitation setting.

Study	Participants (n)	Country	Screening tool used	Exclusion criteria	Time of screening	Prevalence of risk of malnutrition (%)
Beck et al. (2001)	400	Australia	FBBC	Living with dementia, communication difficulties	Upon admission	86.0
Charlton et al. (2010)	1615	Australia	MNA-SF	NI	Up to 3 days post admission	91.9
Hertroijs et al. (2012)	366	Netherlands	SNAQ SNAQRC SNAQ65+ MUST MNA-SF	NI	NS	54.6 70.2 43.4 39.8 73.5
Kaiser et al. (2011)	98	Italy	MNA-SF	NI	NS	86.7
Neumann et al. (2005)	133	Australia	MNA-SF	Unable to give informed consent, too ill	Up to 4 days post admission	59.0
Sánchez-Rodríguez et al. (2017)	95	Spain	MNA-SF	Living with moderate to severe dementia	Upon admission	100
Shiraishi et al. (2017)	108	Japan	MNA-SF	NI	Upon admission	84.2
Slattery et al. (2015)	176	Australia	MNA-SF	NI	Upon admission	78.0
Söderhamn et al. (2007)	147	Sweden	NUFFE	Communication difficulties, non-oral food intake	Up to 2 weeks post admission	69.0
Wakabayashi & Sashika (2014)	169	Japan	MNA-SF	NI	Upon admission	100

The tool mostly used to determine the prevalence of risk of malnutrition in older persons was the MNA-SF. To aid comparability throughout the studies which used the MNA-SF, prevalence was calculated as a score on the MNA-SF of 0 to 11. Yet, some studies used a different screening tool. Beck et al. (2001) used the FBBC (Ferguson, Bauer, Banks, Capra) malnutrition screening tool, which is a validated tool designed to be used for hospital inpatients. Söderhamn et al. (2007) used the NUFFE (Nutrition Form for the Elderly), which was designed to be used for the older person. However, this tool was deemed to be a fairly reliable and valid instrument, when tested against the full MNA (Söderhamn, & Söderhamn, 2002). Hertroijs et al. (2012) used the SNAQ, MUST, MNA-SF, SNAQ65+ and SNAQRC, where the latter three are specifically designed to be used for persons over the age of 65 years

NI: Not Included; NS: Not Specified

When discussing the results from studies investigating the prevalence of risk of malnutrition, the exclusion criteria for each study needs to be explored. The studies by Beck et al. (2001), Neumann et al. (2005) and Söderhamn et al. (2007) (Table 2.7), had exclusion criteria which according to Weekes, Elia and Emery (2004) predisposed the older persons to malnutrition. Therefore, potentially decreasing the prevalence rate of risk of malnutrition in these studies. Still, the study by Sánchez-Rodríguez et al. (2017), also excluded person living with moderate to severe dementia. These persons are known to have a greater risk of malnutrition when compared to persons who do not have dementia (Weekes et al., 2004). Yet, a prevalence of risk of malnutrition of 100% was recorded.

The lack of exclusion criteria for older persons who participated in the studies by Charlton et al. (2010), Hertroijs et al. (2012), Kaiser et al. (2011), Shiraishi et al. (2017), Slattery et al. (2015) and Wakabayashi and Sashika (2014) meant that these studies represent more the true prevalence of risk of malnutrition in the rehabilitation setting, than studies with more stringent inclusion criteria. The same can be said for the study by Kaiser et al. (2011) who included older persons living with dementia and Wakabayashi and Sashika (2014) who included older persons having non-oral nutritional intake.

Another important observation when discussing the prevalence of risk of malnutrition is the time malnutrition screening was undertaken. The longer one takes to screen for malnutrition after admission to hospital, such as in the studies by Neumann et al. (2005) and Söderhamn et al. (2007) (Table 2.7), the greater the possibility that a number of risk factors for malnutrition (Table 2.2) could come into play. These could lead to a higher prevalence of risk of malnutrition.

2.8.1 Variables in Risk of Malnutrition

From the retrieved studies on prevalence of risk of malnutrition, only Shiraishi et al. (2017); Söderhamn et al. (2007) and Wakabayashi and Shashika. (2014) investigated whether there was a correlation between the gender or the age of the older persons and

their nutritional status. Both Shiraishi et al. (2017) and Söderhamn et al. (2007) showed that there was a statistically significant association between higher age of the older persons and risk of malnutrition. This could be explained by the possible increase in the number of physiological and psychological (Table 2.2) which might occur as a person grows older. Leading to poorer nutritional status of an older person.

The studies by Söderhamn et al. (2007) and Wakabayashi and Shiraishi et al. (2017) both agreed that gender did not affect the nutritional status of the older persons admitted in a rehabilitation hospital. This is plausible since malnutrition risk factors affect all persons equally, irrespective of their gender.

Recently, Wei, Nyunt, Gao, Wee and Ng (2017) investigated the association between frailty and malnutrition in community dwelling adults living in Singapore. Frailty, was defined by Fried et al. (2001) as a state of increased susceptibility of decline in the body's reserves and function. This will compromise the ability of the person to cope with the daily or acute episodes of stress. Wei et al. (2017) used the MNA-SF to screen for malnutrition and the Fried criteria (weight loss, weakness, slowness, exhaustion and low activity) to quantify the presence of frailty. This study concluded that frailty increased with higher risk of malnutrition. Moreover, Boulos, Salameh and Barberger-Gateau (2016) established that older persons who were either at risk of or diagnosed as malnourished, had a fourfold increase in risk of frailty.

Weight loss is a symptom shared in common amongst persons who are either frail or at risk of malnutrition. One has to note that most of the symptoms of frailty, most notably, slowness, exhaustion and low activity can be easily noticed. This is unlike identifying a person at risk of malnutrition, where specific questions regarding decreased food intake, weight loss, mobility, psychological stress and neuropsychological problems have to be asked (Vellas et al., 2006). Thus, identifying frail older persons can indirectly help in identifying older persons at risk of malnutrition.

2.9 NURSES' ROLE IN NUTRITION CARE

Nurses are amongst the first professionals to meet the older persons upon their admission to hospital. Often they spend a significant amount of time at the bedside of the person. As such, nurses have been identified as the professionals who are most suited to conduct malnutrition screening (Green & Watson, 2005).

Screening the older person upon admission to hospital for malnutrition is the first step in identifying and treating malnutrition. This is followed by a request for an assessment by a dietitian, for any person found at risk of malnutrition. In which case, the dietitian will assess the older person for malnutrition and draw up a nutrition care plan. Routine nursing care includes the implementation of the nutrition care plan. This will ensure increased chances of improved nutritional status of the older person (Cascio & Logomarsino, 2018). As such, authors highlight the important role which nurses have in improving the nutritional status of older persons (Duerksen et al., 2016; Sauer et al., 2016).

2.9.1 Referrals to the Dietitian

Few retrieved studies investigated the referral rate to the dietitian, of older persons at risk of malnutrition. As could be seen from Table 2.8, the majority of older persons identified as at risk of malnutrition were not referred to a dietitian.

In all of the studies listed in Table 2.8 below, it is not clear whether a dietitian was specifically consulted to assess the older person for being at risk of malnutrition or for other causes which required nutrition intervention. However, it is likely that in the studies by Dent, Wright, Hoogendijk & Hubbard (2018), Neumann et al. (2005) and van Zwienen-Pot et al. (2017), consultation outside the malnutrition remit were involved, as well-nourished persons were also assessed by a dietitian.

Of note is the particular low percentage of older persons assessed by a dietitian in the study by Adams, Bowie, Simmance, Murray & Crowe (2008), in comparison to the other listed studies. This might have been due to the study by Adam et al. (2008) looking only

at referrals to the dietitian to assess malnutrition risk in older persons, as there were no persons assessed by a dietitian who were well nourished.

Table 2.8: **Studies showing the rate of referral of older persons to the dietitian.**

Study	Setting	Country	Participants (n)	Referral rate of older persons at risk of malnutrition (%)	Referral rate of well-nourished older persons (%)
Adams, et al. (2008)	Tertiary teaching hospital	Australia	100	9.0	0.0
Dent et al. (2018)	Geriatric evaluation and management unit	Australia	172	38.6	25.7
Neumann et al. (2005)	Rehabilitation Unit	Australia	133	42.0	40.0
van Zwienen-Pot et al. (2017)	Nursing home rehabilitation ward	Netherlands	179	56.0	21.0

These findings hint that referral rate to the dietitian of hospitalised, older persons, at risk of malnutrition is low, suggesting that malnutrition many a times goes unrecognised, undiagnosed and untreated (Bavelaar, et al., 2008; Sauer et al., 2016; Watterson et al., 2009).

2.10 DONABEDIAN QUALITY OF CARE MODEL

Nurses have a pivotal role in malnutrition care (Banks et al., 2007). This is attributed to the fact that nurses are at the bedside of the hospitalised persons 24 hours a day. Due to their crucial role, knowledge on malnutrition in the older persons could contribute towards improving the nutritional status of the older person (Adams et al., 2008). According to Donabedian (2002), the quality of care could be seen as a continuum, where the structures will influence the process, which in turn will affect the outcome.

The structures in the Donabedian Quality of Care Model refer to the characteristics of the settings where the care is provided. These characteristics can range from physical aspects, including the building and equipment, as well as financial aspects and human resources. Donabedian (2002), refers to the process as the clinical care provided. Whilst outcome refers to the effect left on the person receiving the care. This effect can include health status, quality of life, knowledge, attitude and behaviour.

When the Donabedian Quality of care Model is used as the theoretical framework for malnutrition in older persons, the structure can include the (a) availability of malnutrition screening tools, (b) knowledge of nurses in identifying the older persons at risk of malnutrition and (c) nurses' attitude in treating malnutrition in older persons. With regards to the process, this could include (a) screening older persons upon admission to hospital, (b) referring older persons found at risk of malnutrition to a dietitian (c) as well as implementing the nutrition care plan provided by the dietitian. Finally, the outcome from the Donabedian Quality of Care Model as viewed from the perspective of malnutrition, would be the nutritional status of the older person (Bauer et al., 2015).

Following the Donabedian Quality of Care Model, having a good structure in place to improve malnutrition in older persons, will lead to a good process, which in turn will translate into a good outcome. Thus, having nurses who are knowledgeable on malnutrition in older persons and them having the appropriate malnutrition screening tool to identify older persons at risk of malnutrition (structure), would lead to identification and referral of older persons at risk of malnutrition to a dietitian (process). This in turn will affect the outcome, whereby the persons' nutritional state would improve (Bauer, et al., 2015).

2.11 NURSES' KNOWLEDGE ON MALNUTRITION

In a number of studies, nurses claimed that a top barrier to provide appropriate nutritional care was their limited knowledge on the topic (Bachrach-Lindström, Jensen, Lundin, & Christensson, 2007; Endevelt et al. 2009; Kubrak & Jensen, 2007). Studies which

investigated the nurses' knowledge on nutrition in older persons are sparse (Endevelt, et al., 2009), with only five studies retrieved (Table 2.9). All these studies focused on general nutrition for older persons, bar the study by Bauer et al. (2015), which investigated specifically malnutrition in older persons.

Table 2.9:   Studies showing the mean knowledge score (%) of nurses on nutrition.

Study	Country	Number of nurses (n)	Mean Score (%)
Bauer et al. (2015)	Austria	420	65.6
Beattie et al. (2013)	Australia	30	55.1
Boaz et al. (2013)	Israel	106	51.9
Crogan et al. (2001)	America	44	65.0
Endevelt et al. (2009)	Israel	159	69.0

The studies listed in Table 2.9, used questionnaires as the means to collect data on nurses' knowledge. All of these studies, except the study by Endevelt et al. (2009) used multiple choice questions, whilst the latter adopted a Likert scale assessment method to gauge the nurses' agreement on ten statements on nutrition. The questionnaire used by Endevelt et al. (2009) was not tested for validity. Thus, any findings from this questionnaire cannot be construed as giving a true measure of the level of knowledge on nutrition of nurses. Furthermore, the response rate was low (26.0%), limiting generalisability of the study.

The questionnaire in the study by Crogan et al. (2001) consisted of 50 questions with only seventeen being designed at a proficient and expert level of complexity on the Benner's Novice to Expert Model. This model grades the complexity of the questions on six levels, with the expert level equivalent to the most difficult questions, followed by the proficient level (Crogan et al., 2001). Whilst this tool was tested for reliability, content validity was assured by reviews from dietitians. Owing to the small, convenient sample and the lower level of complexity of the majority of the questions, the higher level of knowledge shown by nurses in this study, should be interpreted with caution.

Boaz et al. (2013) employed a probability sample to select the participants from an acute hospital, whist Beattie et al. (2013) invited all the nurses who worked in a residential aged care facility to fill in the knowledge questionnaire. Both studies obtained similar knowledge score. Neither one of these studies commented about the level of difficulty of the questions. Additionally, nothing was mentioned about the tools' reliability and validity. Moreover, although the aim in the study by Boaz et al. (2013), was to establish the knowledge of nurses on hospitalised older persons, the questions used were not all on nutrition in older persons.

Bauer et al. (2015) used the Knowledge of Malnutrition-Geriatric (KoM-G) questionnaire, which is a questionnaire specifically aimed at testing the knowledge on malnutrition. The questionnaire was proved to be both reliable and valid (Schönherr, Halfens & Lohrmann, 2015). Moreover, when tested for item difficulty, the questionnaire scored 60.6%, which lies within the recommended score level for questionnaires having similar number of response options per question as the KoM-G questionnaire (Measurement and Innovation Center, 2003). Another positive attribute in this study was the large sample size. Yet, as the nursing directors themselves decided towards which institution and nurses the questionnaires were disseminated, this might have led to a potential bias.

In Malta, Fiorini (2007), tried to establish the knowledge on nutrition of the multidisciplinary team, working in an older persons' assessment and rehabilitation hospital. This study used a convenience sample of 15 nurses and a knowledge questionnaire which was developed by another researcher. Even though the study took place in an older persons' hospital setting, the questions were targeted on general nutrition rather than on older persons' nutrition. The mean knowledge score was 52.9%, in line with the studies by Beatie et al. (2013) and Boaz et al. (2013). However, owing to the sampling method and the number of participants, the results could not be generalised.

2.11.1 Association between Nurses' Knowledge and Independent Variables

The findings by Bauer et al. (2015), Beattie et al. (2013) and Boaz et al. (2013), all showed that there was no association between nurses' knowledge and their age, gender or years of nursing experience. Crogan et al. (2001), also supported the finding that the knowledge level was not associated with years of nursing experience. However, Endevelt et al. (2009), found that community nurses younger than 40 years had significantly better nutrition knowledge than those older than 50 years. The authors attributed this to a change in the nursing curriculum, which included greater exposure to nutrition education.

This potential explanation was supported by Crogan et al. (2001) who found that registered nurses had a significantly better knowledge on nutrition, than licenced nurses. Registered nurses received more nutrition lectures in their course than licenced nurses. This finding was also supported by Bauer et al. (2015), who found that nurses who received training in malnutrition had a statistically significant higher knowledge on the topic of malnutrition in older persons, than nurses who did not receive such training. The same trends in results were noticed by Beattie et al. (2013), who observed that nurses with higher educational levels tended to have higher knowledge score on nutrition. Despite the trend, the observations did not reach statistical significance. Contrary to these results, Boaz et al. (2013), did not find any association between the nurses' knowledge on nutrition and their level of academic education.

Even though nurses' knowledge on nutrition is fundamental to provide adequate nutrition care (Boaz et al., 2013), the limited amount of studies reveal that nurses might be lacking this knowledge (Beattie et al., 2013; Endevelt et al., 2009; Schaller & James, 2005). Moreover, despite malnutrition is highly prevalent in older persons and more so in rehabilitation hospitals, none of the retrieved studies focused on nurses' knowledge on malnutrition on older persons' in this setting.

2.12 CONCLUSION

Malnutrition in older persons is still a burden throughout the healthcare system, especially in rehabilitation (Kaiser et al., 2011; Neumann et al., 2005; Slattery et al., 2015). Despite the advances in medical care and the potential consequences of malnutrition, the basic need of meeting the nutritional requirements of the older persons, at times seems to be overlooked and given lack of priority. To overturn this trend, malnutrition screening needs to be done upon admission to hospital. Moreover, whenever a person is at risk of malnutrition, referral of the person to a dietitian is warranted. The dietitian will in turn assess the person for the presence or otherwise of malnutrition and devise an appropriate nutrition care plan. For this to materialise, nurses need to be knowledgeable on the subject.

The next chapter will outline the methodology used for this study in order to determine the nurses' knowledge on and the prevalence of risk of malnutrition in older persons, upon admission to a rehabilitation hospital.

CHAPTER 3
METHODOLOGY

3.1   INTRODUCTION

This chapter provides an overview of the methodology used in this study and how this was deemed to fit best this research. The procedures employed are described, as well as the inclusion criteria, sample size, validity and reliability of the used tools, the pilot study, ethical considerations and data analysis.

3.2   AIMS AND OBJECTIVES

A gap in the literature regarding the knowledge of nurses, working in a rehabilitation hospital, on malnutrition in older persons has been identified. Along with, an absence of local information on the prevalence of risk of malnutrition, upon admission of older persons to a rehabilitation hospital. Thus, this research study sought to fill these gaps. Consequently, the three main aims of this research study were:

1. To determine the knowledge on malnutrition in older persons, of nurses working at Karin Grech Rehabilitation Hospital (KGRH).

2. To establish the prevalence of risk of malnutrition, in older persons upon admission to KGRH.

3. To determine the referral rate of older persons identified as at risk of malnutrition, to the Department of Nutrition and Dietetics (DND) at KGRH, for assessment and management of malnutrition.

The specific objectives of this study were:

1. To determine the knowledge on malnutrition in older persons, of nurses working at KGRH, using the Knowledge of Malnutrition-Geriatric (KoM-G) questionnaire.

2. To determine the association or otherwise between the (a) age, (b) gender, (c) years of nursing experience or (d) highest academic qualification, of the nurses working at KGRH and their mean KoM-G score.

3. To establish the prevalence of risk of malnutrition, in persons aged 65 years or older, upon admission to KGRH. Risk of malnutrition being defined as a Mini Nutritional Assessment – Short Form (MNA-SF) score of ≤ 11.

4. To establish if the (a) age or (b) gender of the older persons admitted to KGRH, was associated with their nutritional status.

5. To determine the percentage of older persons, referred to the DND at KGRH, for malnutrition assessment and management, after being identified as at risk of malnutrition.

6. To determine the association or otherwise between the (a) age, (b) gender or (c) MNA-SF score category, of the older persons found at risk of malnutrition upon admission to KGRH, and referral to the DND for malnutrition assessment and management.

3.3   RESEARCH FRAMEWORK

The philosophical worldviews were considered, in order to decide how best to approach this research study. Accordingly, the research design and the method of data collection were then chosen.

3.3.1 Philosophical Worldview

As mentioned above, this study sought to produce instrumental knowledge, which facilitated the researcher's knowledge on the current state of the themes being investigated. It was assumed that reality on (a) the nurses' knowledge, (b) the risk of malnutrition of the older persons, upon admission to KGRH and (c) whether or not the older persons were referred to the DND, existed independently and were not based on the

researcher's interpretation of this reality. This ontology followed the realist's viewpoint of the world.

For a realist, epistemology, is produced through careful observations of the world (Neuman, 2014). In doing so, information is gained. Based upon this, the idea on reality is verified or falsified, ultimately leading to an objective knowledge of the world. In a positive paradigm, a realist ontology and epistemology perspective is adopted (Neuman, 2014). Positivists believe that through careful observations of reality, researchers can predict relationships between variables.

However, Creswell (2014), ascertained that in the study of humans, and notwithstanding the truth of reality, there will still be uncertainty as to the unveiling of the absolute truth. This post-positivist approach, moved away from an absolute truth of knowledge to a probabilistic one.

3.3.2 Research Design

A post-positivist worldview is reductionist in nature, as it seeks to reduce the idea into smaller variables. It is also deterministic, as it strives to determine relationships amongst variables, through the testing of hypotheses (Roger, 2015). Inherently, post-positivist, seek to gain knowledge through careful observations and objective measurement of the variables of interest. Therefore, a quantitative research design was considered to be best suited for this project (Neuman, 2014), through which numerical data was produced.

3.3.3 Research Methods

This study employed a cross-sectional approach. A survey, using a self-administered questionnaire, was chosen for collecting data from nurses. The benefits of this method, were in (a) the possibility of a larger sample size, (b) faster data collection in the limited time available and (c) the opportunity for nurses to compile the questionnaire at their convenience. Moreover, if the number of nursing participants was representative of the target population, then the findings could be inferred to the target population (Neuman,

2014). These advantages outweighed the disadvantages of the (a) inability of the researcher to clarify queries from nurses on the questions asked in the questionnaire and (b) possibility that the questionnaire was not filled by the intended participants (Peat, 2002). Therefore, a self-administered questionnaire, was deemed the best suited approach towards gaining information on the nurses' variables of interest.

Additionally, content analysis of the older persons' medical file was used to collect data on variables of interest concerning the older persons admitted at KGRH. These included (a) the MNA-SF score, upon admission to KGRH, (b) the age, (c) the gender and (d) whether referred to the DND at KGRH for malnutrition assessment and management.

Content analysis is mostly used in quantitative studies (Neuman, 2014). It was considered as the best fit data collection method for the aforementioned variables, as it is routine care for the nurses at KGRH to check and record all the variables under investigation in the persons' medical file. This method allowed the researcher to collect the required data without imposing added burden on the older persons, through the re-administration of the malnutrition screening tool and asking questions already enquired by the nurses. Moreover, it was time saving and offered the possibility for the researcher to collect data on the older persons' risk of malnutrition at a later stage from when the person was admitted to hospital, increasing the researcher's flexibility.

3.4 HYPOTHESES

As this study followed a post-positive paradigm, one of the intents was to determine associations amongst variables. The tested null hypotheses were:

1. The (a) age, (b) gender, (c) years of nursing experience or (d) highest academic qualification of nurses working at KGRH, was not associated with their mean percentage knowledge score on malnutrition in the older persons.

2. The (a) age or (b) gender, of the older persons was not associated to their nutritional status upon admission to KGRH.

3. The (a) age, (b) gender or the (c) MNA-SF score category of older persons found to be at risk of malnutrition, upon admission to KGRH, was not associated with referral to the DND for malnutrition assessment and management.

3.5 CONCEPTUALIZATION AND OPERATIONALIZATION

For the purpose of this study, the concepts have been defined as shown in Table 3.1.

Table 3.1:   **Definitions of concepts used in this research study.**

Concept	Definition
Academic qualification	Qualification obtained from a recognised institution.
Knowledge	Information and understanding about a subject which a person has (Collins English Dictionary, 2018).
Malnutrition	Undernourishment, which leads to weight loss and muscle wasting (Chen et al., 2001).
Nutritional Status	The state of a person's health in terms of the nutrients in his/her diet (National Cancer Institute, 2018)
Older person	A person with a chronologic age of 65 years or older (WHO, 2002).
Prevalence	The proportion of persons in a population who have a particular disease over a specified period of time (Centers for Disease Control and Prevention, 2017).
Rehabilitation hospital/setting	Inpatient setting which provides interdisciplinary care, with a focus on recovery of function to the pre-hospital state, after an illness or a decline in function (van Zwienen-Pot et al., 2017).
Risk of Malnutrition	A score between 0 and 11 on the MNA-SF.

Variables were interlinked with techniques and procedures, as specified in the operational definitions in Table 3.2.

Table 3.2: **Operational definitions of variables used in this research study.**

Variable	Measure
Academic qualification	Certificate, Diploma, Degree, Master, Doctoral.
Age	Chronological age of a person.
Gender	Male, Female, Other.
Knowledge on malnutrition	Knowledge of Malnutrition – Geriatric questionnaire (KoM-G).
Nutritional status	At risk of malnutrition, normal nutritional status.
Older person referred to Department of Nutrition and Dietetics (DND) KGRH	Yes referred to the DND/No not referred to the DND.
Prevalence	The percentage of older persons scoring 0 to 11, on MNA-SF, upon admission to KGRH, in relation to the total number of older persons, who participated in this study, over a two month period.
Risk of malnutrition	A score of 0 to 11 on the MNA-SF, upon admission to KGRH.
Years of nursing experience	Number of full calendar years working in the nursing profession.

3.6 RESEARCH SETTING

The chosen site for this research study was Karin Grech Rehabilitation Hospital (KGRH). This is a 274-bed hospital, designed to offer inpatient rehabilitation service. The hospital employs an interdisciplinary team, which together with the admitted person and their carers, aim to maximize the functional abilities of each admitted person (Refer to the Glossary of Terms for more information on KGRH).

3.7 PARTICIPANTS

The target population refers to the population to which the researcher would like to generalise the study finding to (Creswell, 2014). There were two target populations in this

research study, (a) all nurses working at KGRH and directly involved in admitting older persons at KGRH and (b) older persons, aged 65 years or over, admitted to KGRH.

3.7.1 Inclusion Criteria

Nurses were eligible to participate in this research study if they fulfilled the following:

- Worked on the wards at KGRH during the data collection period.
- Had clinical duties, including admitting older persons at KGRH.

For the medical file of the older persons to be analysed by the researcher, the older persons had to fulfil the following inclusion criteria:

- Had a chronological age of 65 years or over.
- Their admission date to KGRH was during the data collection period.

3.7.2 Sample

The whole nursing population at KGRH stood at 173 nurses. As explained in Figure 3.1, the target population of nurses for this study amounted to 144 nurses.
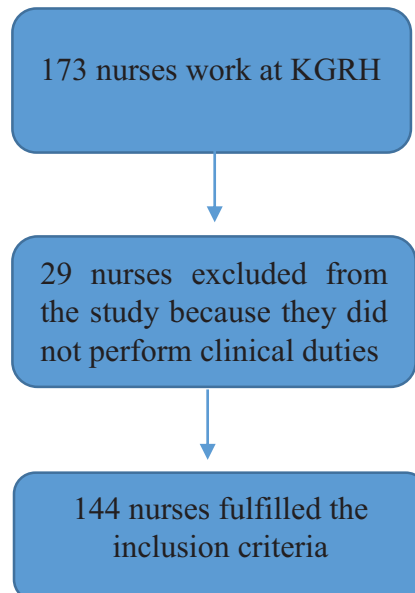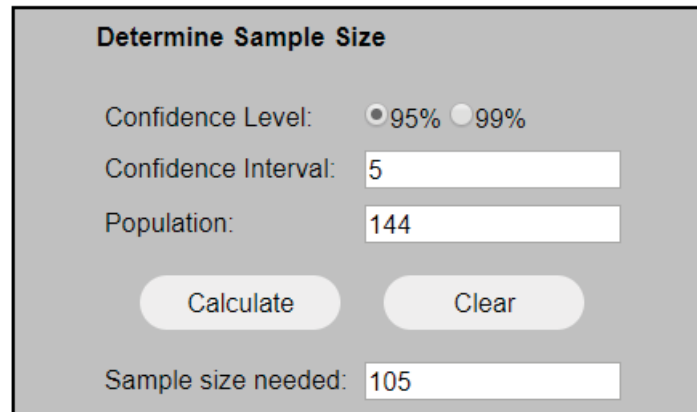
Figure 3.1:   **Target population of nurses.**

The above figure indicates that the total number of nurses working at KGRH during the data collection period amounted to 173 nurses. Twenty-nine nurses were excluded as these did not have clinical work, including admitting older persons to KGRH. These nurses consisted of, nursing mangers, deputy and charge nurses working on the wards, nurses doing administrative duties and specialist nurses.

In quantitative studies, for results to be representative of the target population, both the sample size and the sampling method need to be considered (Neuman, 2014). Assuming a degree of confidence of 95% and a margin of error of 5, the required sample size of nurses needed to be representative of the target population was calculated to be 105 nurses (Figure 3.2).

Figure 3.2:   **Sample size needed to generalise the findings to the target nurses population.**

The confidence level was set at 95% and the Confidence Interval (margin of error) at 5. These settings were advised by a statistician (L. Camilleri, personal communication, April, 2018) and are the standard levels in most research studies. Using the online sample size calculator, available at https://www.surveysystem.com/sscalc.htm, the number of nurses needed to participate in this study, so to generalise the findings to the target population, was calculated to be 105 nurses.

With intent to obtain the highest response rate possible and achieve representation, in consultation with a statistician (L. Camilleri, personal communication, April, 2018), it was decided to invite all the target nurses' population to participate in this study. This due to the fact that there was (a) minimal difference of 39 nurses between the target nurses' population (144 nurses) and the sample size required to generalise the findings (105 nurses) and (b) conjecturing that not all the nurses invited to participate in the study would accept to the invitation. Yet, this limited the study to a convenience sample.

With regards to the older persons' population, all the older persons who satisfied the inclusion criteria were invited to take part in the study. Based on the admission statistics of KGRH for the year 2017, it was estimated that 220 older persons would be admitted to KGRH during the data collection period, 60.0% of whom would be female (Abela, 2017).

3.8   RESEARCH INSTRUMENTS

The main tools used to collect the required data in conducting this research study consisted of the Knowledge of Malnutrition-Geriatric questionnaire (KoM-G) (Appendix A, B) and the Mini Nutritional Assessment - Short Form (MNA-SF) (Appendix F). In addition, a researcher developed demographic questionnaire, data collection form, consent forms and information sheets were used (Table 3.3). These were made available in both the English and Maltese languages, except for the MNA-SF. At KGRH, only the English version of the MNA-SF was routinely used. As the researcher wanted to identify what happens in reality and because in this study the nurses administered the MNA-SF to the older persons, it was decided to use the English MNA-SF version.

Table 3.3:   The research instruments used in this study and the information collected.

Research Instrument	Filled by	Information collected
Data Collection Form	Researcher	Older persons' age, gender, MNA-SF score and referred or otherwise to the DND
Demographic Questionnaire	Nurses	Nurses' age, gender, years of nursing experience and highest academic qualification
KoM-G	Nurses	Knowledge of nurse on malnutrition in older persons
MNA-SF	Nurses	Malnutrition risk score of older persons

The KoM-G questionnaire was used to collect information on the knowledge base of nurses on malnutrition in the older persons. This was a nineteen question, multiple choice questionnaire, developed by Schönherr, Halfens & Lohrmann (2015). Each question had six optional answers, including an 'I don't know' option. All questions could have one or more correct answers, from the six options provided (Figure 3.3).

Question 1: What are the possible risk factors for malnutrition?

- 🔵 Dependency for care
- 🔵 Depression
- ⚪ Incontinence
- 🔵 Cancer
- 🔵 Intake of multiple medications (more than 5 a day)
- ⚪ I don't know

Question 7: What is the normal and healthy BMI (Body Mass Index) of residents 65 years or older?

- ⚪ 17-22kg/m^2
- ⚪ 19-24 kg/m^2
- 🔵 22-27kg/m^2
- ⚪ 24-29 kg/m^2
- ⚪ 27-32kg/m^2
- ⚪ I don't know

Figure 3. 3:   Sample of correctly answered questions in the KoM-G questionnaire.

Each question in the KoM-G questionnaire had six options. The last option was always 'I don't know'. Each question in the KoM-G had one or multiple correct answers as shown in the figure, with the filled circles indicating the correct answer/s.

The profile characteristics of the nurses, (a) gender, (b) age, (c) years of nursing experience and (d) highest academic qualification, were compiled at the beginning of the KoM-G, through the Demographic Questionnaire (Appendix C, D).

A researcher designed Data Collection Form (Appendix E) was used to record the older persons' (a) MNA-SF score, (b) age, (c) gender and (d) whether referred or otherwise to the DND at KGRH.

The MNA-SF was developed by Nestlé Nutrition Institute, (2009) to identify persons aged 65 years or over, who were at risk for malnutrition. Whilst being easy to administer and requires no special training, it takes less than 5 minutes to be completed (Nestlé Nutrition Institute, 2009).   It consists of six questions (A to F), with two to four options

in each question, to choose one. Each option has a score attached to it, ranging from 0 to 3. A total score between 0 and 11 indicates an older person as at risk of malnutrition. Whilst a score of 12-14 indicates a normal nutritional status. The highest risk of malnutrition is observed with a score of 0 to 7, this is termed 'malnourished' on the MNA-SF. A lower risk of malnutrition is seen with a score of 8 to 11 and is termed 'at risk of malnutrition' on the MNA-SF. No risk of malnutrition is observed with an MNA-SF score of 12 to 14, this is termed 'normal nutritional status'.

3.8.1 Reliability and Validity

Roger (2015) defined reliability as the extent to which an instrument yields the same results upon repeated use, as long as variables which can affect the results are not changed. The best method to check for reliability of a questionnaire is to check its equivalence reliability (Creswell, 2014). This can be done by analysing the questionnaire's internal consistency, such as through the split half method, using the Kuder-Richardson 20 test (Creswell, 2014). When the authors of the KoM-G tested the tool for reliability using the Kuder-Richardson 20, a score of 0.69 was obtained. They acknowledged such a level to be acceptable. Thus, concluded that the KoM-G was a reliable questionnaire to assess knowledge on malnutrition in older persons (Schönherr et al., 2015).

Validity, as explained by Creswell (2014), has to do with how well the conceptual definition under investigation and the construct that the tool is supposed to measure, match each other. In this case, how well the KoM-G truly measures the knowledge on malnutrition in older persons. A Delphi technique was used to measure content validity of the KoM-G questionnaire, through the input of eight international experts on malnutrition including, dietitians, a medical doctor, nurses and researchers on malnutrition. Through this technique, Schönherr et al. (2015) calculated a Scale Content Validity Index Average (S-CVI/Ave) of 0.91. According to Polit, Beck and Owen (2007), a S-CVI/Ave score greater than 0.9 is a high enough score to guarantee validity of an instrument. Internal validity was also assured in this study by pilot testing the research instrument, to confirm that the wording was clear and unambiguous.

With regards to the reliability of the MNA-SF, the interrater reliability was evaluated using Cohen's Kappa. This showed an overall good screening score between and amongst nurses (Bååth, Hall-Lord, Idvall, Wiberg-Hedman, & Wilde Larsson, 2008).

The WHO Clinical Consortium on Healthy Ageing (2017) calculated the discriminant validity of the MNA-SF, using data from various studies. It was concluded that the MNA-SF has a sensitivity of 90% and a specificity of 83%. A meta-analysis conducted by the Academy of Nutrition and Dietetics (2018) concluded that the MNA-SF exhibited a moderate degree of validity and a moderate degree of interrater reliability, across care settings.

Therefore, it could be said that the tools used in this research study, the KoM-G and the MNA-SF, were both proved to be reliable and valid instruments to measure respectively, the nurses' knowledge on malnutrition in older persons and the risk of malnutrition in persons, aged 65 years or over.

3.9   RESEARCH PROCEDURE

As explained below, the procedure to collect the data consisted of two parts. The first part concerned recruitment and data collection from nurses. The second part consisted of obtaining informed consent from the older persons or their relative/s or guardian/s, which enabled the researcher to retrieve, record and analyse data from the older person's medical file.

3.9.1   Research Procedure Part 1… Nurses

Recruitment of potential nursing participants took place between the 1st and the 15th August 2018, during the nurses' handover period. The gatekeeper (Appendix G) approached potential nursing participants, who fulfilled the inclusion criteria. She gave a brief overview of the study and handed the information sheet regarding the research study to the nurses (Appendix H, I). The gatekeeper invited nurses to approach the researcher, via mobile or e-mail, should they favour participation in the study.

Once nursing participants approached the researcher, the study was explained in more detail. The nurses who confirmed their participation were handed two consent forms (Appendix J, K), together with the KoM-G and the Demographic Questionnaire. The nurses were instructed to keep one consent form. The other signed copy of the consent form was to be deposited together with the filled-in questionnaires, in a sealed questionnaire box, located within the ward. The researcher collected the sealed boxes and data collection was finalised by the end of August 2018 (Figure 3.4).

The gatekeeper approached nurses who fulfilled the inclusion criteria, a) gave a brief overview of the study b) gave the information sheet for nurses.

Interested nurses contacted the researcher via mobile/e-mail.

The researcher explained the study in detail. To the nurses who wished to participate, a) two consent forms, b) KoM-G questionnaire and c) demographic questionnaire were given.

The nurses self-administered the quesitonnaires and retained a signed copy of the consent form.

The researcher collected the sealed questionnaire box containing the signed consent forms, KoM-G and demographic questionnaires.

Figure 3.4:   Data collection procedure...Nurses.

3.9.2　　　　Research Procedure Part 2… Older Persons

Between the 19th September until the 19th November 2018, the gatekeeper, collated the list of newly admitted older persons within KGRH. Newly admitted older persons who fulfilled the inclusion criteria, were approached by the gatekeeper, who in turn gave the person an overview of the study and invited them to participate in the research study. If the older person showed interest towards participation, the gatekeeper forwarded the information sheet for older persons (Appendix L, M) in either the Maltese or English language, depending on her/his preference. The older person could opt for the gatekeeper to read to her/him the information sheet. Following this, and if the older person expressed willingness to participate in the project, the gatekeeper informed the researcher of the older person's interest in the study.

The researcher approached the older person and explained the study in detail. If the older person wished to participate, two consent forms (Appendix N, O) were forwarded to her/him. The older person had the option for reading assistance from the researcher. The older person retained a copy of the signed consent form while the other one was kept by the researcher (Figure 3.5).

Should the gatekeeper have identified an older person who had some form of cognitive problems, the gatekeeper approached the relative/s or guardian/s of those older persons, briefing them about the study. The information sheet in either the Maltese or English language (Appendix P, Q) was in turn handed to interested relative/s / guardian/s and reading assistance was offered by the gatekeeper. Interested parties were invited to meet the researcher, where the study was explained in detail. The relative/s / guardian/s who agreed to consent for the older person's participation in the study signed two consent forms (Appendix R, S), one of which was kept by the researcher and the other one by the relative/s / guardian/s (Figure 3.5)

Upon obtaining informed consent from the older person or the relative/s / guardian/s the researcher requested the nurse in charge of the ward for the medical file of the older person. Content analysis was conducted to retrieve the (a) MNA-SF score, (b) age, (c)

gender and (d) whether the older person was referred to the DND for malnutrition assessment and management. All this information was recorded on the Data Collection form (Appendix E) (Figure 3.5).   If it was noticed that an older person was at risk of malnutrition but was not referred to the DND for malnutrition assessment and management, the researcher informed the Clinical Chairperson, who in turn ensured that the older person received this service.

The gatekeeper approached older persons who fulfilled the inclusion criteria,

a) gave a brief overview of the study b) gave the information sheet for older person.

The gatekeeper approached relative/s / guardian/s of older persons who fulfilled the inclusion criteria and who had cognitive impairment,

a) gave a brief overview of the study b) gave the information sheet for relative/s /guardian/s.

Reading assistance was offered to the older persons. If they favoured participation the gatekeeper contacted the researcher.

Reading assistance was offered to the realitve/s / guardian/s of the older persons. If they favoured participation of the older person, the gatekeeper contacted the researcher.

The researcher approached the older persons and explained the study in detail. If they wished to participate, a) two consent forms were given, b) reading assistance was offered c) older persons retained a copy of the consent form.

The researcher approached the relative/s /guardian/s of the older person and explained the study in detail. If they wished the older person to participate, a) two consent forms were given, b) reading assitance was offered, c) relative/s /guardian/s retained a copy of the consent form.

The researcher asked the nurse for the older person's medical file.

The researcher asked the nurse for the older person's medical file.

The researcher conducted content analysis of the medical file to retrieve and record the needed data.

The researcher conducted content analysis of the medical file to retrieve and record the needed data.

Figure 3.5: Data collection procedure…older persons.

3.10   PILOT STUDY

A pilot study was conducted during July 2018, with the aim of pinpointing potential issues in the research process. Specifically, the pilot sought to ascertain that the procedure to recruit the older persons and nursing participants was feasible. It also served to check whether the (a) procedure of collecting the data was practical, (b) instructions on how to fill the KoM-G were well understood, (c) questions and answer options on the KoM-G and the demographic questionnaire were well comprehended (d) the length and time taken to complete the questionnaires was acceptable. The pilot study also served to identify any issues with data analysis.

As suggested by Couchman and Dawson (1996), the pilot study was carried out on at least 10% of the sample size, where 15 nurses were invited by the gatekeeper to participate in the pilot study. Also, they were asked to provide written feedback on the study procedure on the Questionnaire Feedback Form (Appendix T). These participants' characteristics are presented in Table 3.4.

Table 3.4:   **Characteristics of nurses who participated in the pilot study.**

The pilot study was conducted between the 8th and 14th July, 2018.

Demographic information	Number of nurses (*n*)
Gender	
Male	5
Female	10
Other	0
Age	
25 years and younger	8
26-30 years	4
31-40 years	2
41 years and older	1
Years of nursing experience	
5 years and less	7
6-10 years	5
11 and more years	3
Highest level of academic qualification	
Certificate	0
Diploma	10
Degree	5
Master	0
Doctorate	0

Additionally, the gatekeeper invited all older persons, who satisfied the inclusion criteria and were admitted to KGRH between the 15th and the 21st July 2018, to participate in the pilot study. These amounted to 24 older persons, whose characteristics are presented in Table 3.5.

Table 3.5: **Characteristics of the older persons who participated in the pilot study.**

Demographic information	Number of older persons (*n*)
Gender	
Male	10
Female	14
Other	0
Age (years)	
65-75	6
76-80	7
81-85	6
86-100	5

3.10.1 Amendments to the Research Procedure

Analysis of the Questionnaire Feedback Form showed that it took an average of 10 minutes to answer the questionnaires. One nurse indicated that the time it took to complete the questionnaires was considerably long. Besides, every nurse agreed that the (a) instructions how to fill the questionnaires, (b) the wording of both the questions and optional answers in the questionnaires were clear and easy to understand. It was therefore deemed appropriate to leave the questionnaires as previously intended.

Moreover, the planned recruitment method of both nurses and older persons was feasible. Furthermore, no issues were identified with (a) data collection, (b) data coding, (c) data entry into SPSS and (d) data analysis. Thus, the study was deemed viable as planned.

3.11 DATA ANALYSIS

As instructed by the authors of the KoM-G questionnaire, 5 or 6 correctly marked options for each of the nineteen questions, warranted a score of 1. If 4 options or less were

correctly marked, a score of 0 was given (Figure 3.6). Therefore, the final score for the questionnaire ranged from a total of 0 to 19. This score was converted to percentage, for ease of comparison with other studies.

As previously mentioned (Section 3.8), a score of 0 to 11 on the MNA-SF was used to identify older persons at risk of malnutrition, upon admission to KGRH. The prevalence of risk of malnutrition, upon admission to KGRH was calculated as the percentage of older persons identified as at risk of malnutrition, in relation to the total amount of older persons who participated in this study.

The referral rate of older persons identified as at risk of malnutrition, to the DND at KGRH for assessment and management of malnutrition was calculated as the percentage of older persons identified as at risk of malnutrition and referred to the DND.

All the questions in the nurses' questionnaires and the data collection form were numerically coded and processed using IBM SPSS Statistics Version 25 (IBM, Armonk, NY, USA). The data was analysed using descriptive statistics and statistical tests applied to test the null hypotheses (Section 3.4). Findings were generated in the form of tables and charts.

a) Question 1: What are the possible risk factors for malnutrition?

- 🔵 Dependency for care
- 🔵 Depression
- ⚪ Incontinence
- 🔵 Cancer
- 🔵 Intake of multiple medications (more than 5 a day)
- ⚪ I don't know

b) Question 1: What are the possible risk factors for malnutrition?

- ⚪ Dependency for care
- 🔵 Depression
- ⚪ Incontinence
- 🔵 Cancer
- 🔵 Intake of multiple medications (more than 5 a day)
- ⚪ I don't know

c) Question 1: What are the possible risk factors for malnutrition?

- ⚪ Dependency for care
- ⚪ Depression
- 🔵 Incontinence
- 🔵 Cancer
- 🔵 Intake of multiple medications (more than 5 a day)
- ⚪ I don't know

Figure 3. 6: Scoring system for the KoM-G questionnaire.

A questionnaire with the correctly marked options was provided by the authors of the KoM-G questionnaire. Each of the 19 questions in the KoM-G questionnaire had 6 options. For each question, every correctly ticked/unticked option was given a value of 1. Therefore, if all the options were correctly marked a total value of 6 was given. For each question, if a value of 5 or 6 was obtained, the researcher gave a score of 1. If 4 or less options were correctly ticked/unticked, a score of 0 was given for that question. Question a) above shows how the options should have been marked for that particular question. b) shows that the first option was wrongly unticked, so 5 options were correctly marked. Therefore, a score of 1 was given for that question. c) shows that the first two options were wrongly unticked and the third option was wrongly ticked. Thus, only 3 options were correctly marked. Hence, a score of 0 was given to that question. As the KoM-G had 19 questions, the final score ranged from 0 to 19. This was converted to percentage for ease of comparison with other studies.

3.12 ETHICAL CONSIDERATIONS

Permission to conduct the study at the chosen site was granted by the Chief Executive Officer at KGRH (Appendix U). The Chief Nursing Manager at KGRH authorized the recruitment of nurses from the named hospital (Appendix V), whilst the Clinical Chairperson Department of Geriatrics KGRH, approved the recruitment of older persons (Appendix W). Permission to translate and use the KoM-G questionnaire to the Maltese language was granted by the authors (Appendix X). The Research Committee KGRH approved the study (Appendix Y) while the Data Protection Officer KGRH approved the data collection (Appendix Z). Finally, ethical clearance was obtained from the Faculty Research Ethics Committee, University of Malta in June 2018 (Appendix ZA).

Participation in the study was through an opt in method, which led to voluntary participation. Informed consent was obtained from all participating nurses and the older persons/relative/s/guardian/s. Confidentiality, anonymity and the right to withdraw from the study or to have any data modified or erased were safeguarded throughout the research process. Moreover, all the collected data was securely stored and once the results of the dissertation are published, it will be destroyed.

Beneficence towards the older persons was ensured by obtaining consent from the older persons/ relative/s/ guardian/s to inform the Clinical Chairperson of any older person who was at risk of malnutrition but not referred to the DND for malnutrition assessment and management. The Clinical Chairperson ensured that this process was enabled.

3.13 CONCLUSION

After obtaining the necessary permissions to conduct this study, the planned study was piloted, with no changes deemed necessary. A quantitative research design was used. Nurses at KGRH filled a self-administered questionnaire and content analysis of the older persons' medical files was conducted by the researcher. Data was subsequently analysed. The subsequent chapter will describe the findings from this study.

CHAPTER 4
FINDINGS

4.1 INTRODUCTION

This chapter is divided into two parts. The first part presents the findings from the nurses' self-administered KoM-G and demographic questionnaires. Whilst the second part presents the findings from the Data Collection Form, containing information obtained through content analysis of the older persons' medical files.

4.2 FINDINGS PART 1… NURSES

This section will present the demographic characteristics of the nursing participants. Moreover, it will depict the knowledge base of the nursing participants, as determined via the KoM-G questionnaire. As already explained in the previous chapter (Section 3.11), the scores from the KoM-G were converted into percentage terms, for ease of comparison against other studies. This section will move on to illustrate the findings from the statistical tests used to determine the presence or otherwise of an association between the (a) age, (b) gender, (c) years of nursing experience and (d) highest academic qualification, of the nurses working at KGRH, and their mean percentage knowledge score.

4.2.1 Demographic Characteristics of Nurses

A total of 144 nurses satisfied the inclusion criteria. Out of whom, 105 nurses accepted and took part in this survey study ($N=105$), achieving a response rate of 72.9%.

Table 4.1 shows that male nurses accounted for 25.7% of the sample size ($n= 27$) and female nurses for 74.3% ($n= 78$). Their age averaged at 32.3 years (SD 11.4). For ease of comparison between the age groups, the age of the nurses was grouped into four age categories, a) 25 years and younger ($n= 34$), b) 26 years to 30 years ($n= 28$), c) 31 years to 40 years ($n= 26$) and d) 41 years and older ($n= 17$).

The nurses' work experience amounted to a mean of 8.5 years (SD 9.6). The years of nursing experience were categorised into a) 5 years and less ($n= 54$), b) 6 to 10 years ($n= 31$) and c) 11 years and more ($n= 20$) (Table 4.1).

Four of the nurses indicated that their highest level of academic qualification in nursing was at certificate level. Fifty-eight nurses had a diploma level, forty-two nurses obtained a degree level of education in nursing and one nurse graduated at master level in nursing. Whilst no one had a doctorate level of academic education (Table 4.1). Owing to the small number of nurses who qualified at Certificate and Master levels, the nurses' highest academic qualification was categorised into two groups, Certificate/Diploma level and Degree/Master level of education.

Table 4.1: **Demographic characteristics of nurses who participated in this study.**

Demographic information	Number of nurses (*n*)	Percentage (%)
Gender		
Male	27	25.7
Female	78	74.3
Other	0	0.0
Age		
25 years and younger	34	32.4
26-30 years	28	26.7
31-40 years	26	24.8
41 years and older	17	16.2
Years of nursing experience		
5 years and less	54	51.4
6-10 years	31	29.5
11 years and more	20	19.1
Highest level of academic qualification		
Certificate	4	3.8
Diploma	58	55.2
Degree	42	40.0
Master	1	1.0
Doctorate	0	0.0

4.2.2 Nurses' Knowledge On Malnutrition

From the 105 completed KoM-G questionnaires, the mean knowledge score on malnutrition in older persons, for the participating nurses was 51.3% (SD 21.3). Table 4.2, shows the sound knowledge base of nurses on the specific nutrient needed by older

persons with pressure ulcers, where 95.2% of nurses answered that these persons had an increased protein requirement. This was followed by 78.1% of nurses who knew that decreased skin turgor, concentrated urine and acute, unexplained confusion, could be possible signs of dehydration in older persons.

Moreover, 74.3% of the nurses were knowledgeable on the possible consequences of malnutrition and 71.4% of the respondents, correctly identified when older persons had to be screened for malnutrition. Additionally, 70.5% of the nurses recognised the indicators which should be assessed in nutritional screening.

Nurses were least knowledgeable on how the daily energy and nutrient requirements for persons aged 65 years or older changed in comparison to adult persons younger than 65 years. From the nursing cohort, 18.1% discerned that the daily calorie requirements decreased and the daily nutrient requirements remained the same, for persons 65 years or over, compared to younger adults. Another aspect of malnutrition in older persons which was known by a minority of 21.0% of the nurses was that the healthy body mass index (BMI) for persons 65 years or over, should be 22 to $27kg/m^2$ (Table 4.2).

Table 4.2:   Mean percentage correct answers for each question on the KoM-G questionnaire.

The same questionnaire was used by Bauer et al. 2015

Dimension	Question	Percentage Correct Answers (%)
Aetiology and consequences of malnutrition	What are the possible risk factors for malnutrition?	50.5
	What are the possible consequences of malnutrition?	74.3
	What are the possible signs of malnutrition?	60.0
	What are the possible signs of dehydration?	78.1
Screening and assessment of nutritional status	Which indicators should be assessed in nutritional screening?	70.5
	When should the residents be screened for malnutrition?	71.4
	What is the normal and healthy BMI (Body Mass Index) of residents 65 years or older?	21.0
	What percentage of unintentional body weight loss in the past 3 months is a possible sign of malnutrition?	27.6
Planning interventions	Which professions should be involved when necessary in treating malnourished residents?	41.9
	A resident has unintentionally lost 3 kg in the last month. What are the steps you would take?	55.2
	In which way does the daily energy and nutrient requirements change for residents 65 years or older?	18.1
	The daily fluid requirement of a person …?	48.6
	What factors can lead to higher energy and protein requirements?	29.5
	What specific nutrient requirements do residents with pressure ulcers have?	95.2
	Why should nurses keep a food and fluid chart?	46.7
Possible interventions for improving nutritional intake	What factors can positively affect oral nutritional intake?	57.1
	What factors can negatively affect oral nutritional intake?	64.8
Enteral and parenteral nutrition	What interventions should be ideally done for a resident with mild dysphagia at risk of malnutrition?	36.2
	For which residents is tube feeding appropriate?	29.5
Mean percentage knowledge score		51.3

4.2.2.1   Assessing Normality of the Nurses' Knowledge Score

As shown in Figure 4.1, the percentage knowledge score was normally distributed in each age category.
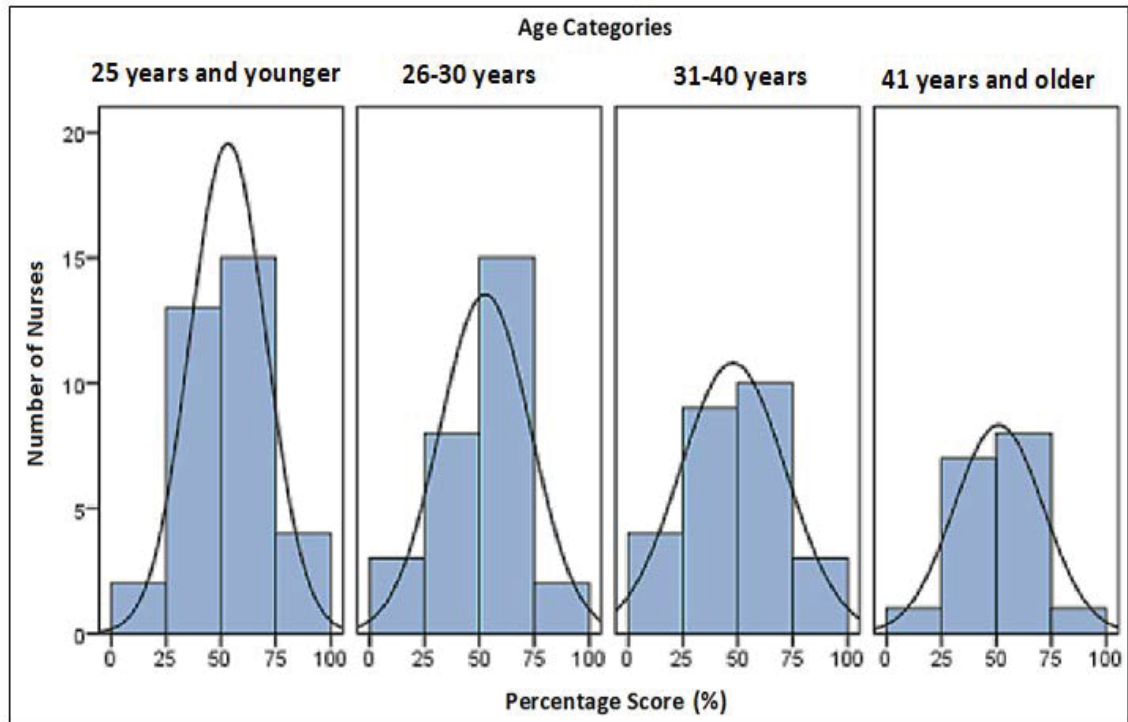
Figure 4.1:   Percentage knowledge score distribution for nurses across the age groups.

This frequency distribution graph included all the nurses who participated in the study (105 nurse), irrespective of their age, gender, years of nursing experience or highest academic qualification achieved. It shows that across the different age categories, the percentage knowledge score of nurses was equally distributed.

In fact, as shown in Table 4.3, the Shapiro Wilk Test used to assess normality of the mean percentage knowledge score of nurses across the different age categories, showed p-value above the 0.05 level of significance.   Thus, the null hypothesis (H_o) specifying that the knowledge score distribution was normal, was accepted. Hence, parametric tests were used to compare mean knowledge scores between different groups of participating nurses.

Table 4.3: **Testing for normality of mean percentage knowledge score across the nurses' age categories.**

		Statistic	df	p-value
Mean Percentage Knowledge Score	25 years and younger	0.983	34	0.849
	26-30 years	0.932	28	0.070
	31-40 years	0.958	26	0.348
	41 years and older	0.933	17	0.242

4.2.3 Hypotheses Testing for Associations between the Independent Variables and Mean Percentage Knowledge Score of Nurses

The Independent Samples t-test was used to compare the mean percentage knowledge scores between two groups of participants, clustered by gender (male/ female) as well as by highest academic qualification (Certificate/Diploma, Degree/Master). The null hypotheses (H_o) specified that the nurses' mean percentage knowledge scores on malnutrition in older persons varied marginally between the two groups and were accepted when the p-value exceeded the 0.05 level of significance. The alternative hypotheses (H_1) specified that the nurses mean percentage knowledge scores on malnutrition in older persons varied significantly between the two groups and were accepted when the p-value was less than the 0.05 criterion.

The one-way ANOVA test was used to compare the mean percentage knowledge scores between three or more independent groups, clustered by the nurses' age categories, (a) 25 years and younger, b) 26 years to 30 years, c) 31 years to 40 years, and d) 41 years and older) and by years of nursing experience grouped as (a) 5 years and less, b) 6 years to 10 years, c) 11 years and more). H_o specified that the nurses' mean percentage knowledge scores on malnutrition in older persons varied marginally between the groups and were accepted if the p-value exceeded the 0.05 level of significance. H_1 specified that the nurses' mean percentage knowledge scores on malnutrition in older persons varied significantly between the groups and were accepted if the p-value was less than the 0.05 criterion.

4.2.4 Nurses' Age Categories and Mean Percentage Malnutrition Knowledge Scores

The highest mean percentage malnutrition knowledge score across the four age categories stood at 53.3% and was obtained by nurses in the age category 25 years and younger. The lowest mean percentage malnutrition knowledge score was calculated to be 47.8%. This was obtained by nurses in the age category 31 years to 40 years. As depicted in Figure 4.2, the mean percentage malnutrition knowledge score for nurses varied marginally between the four different age categories.
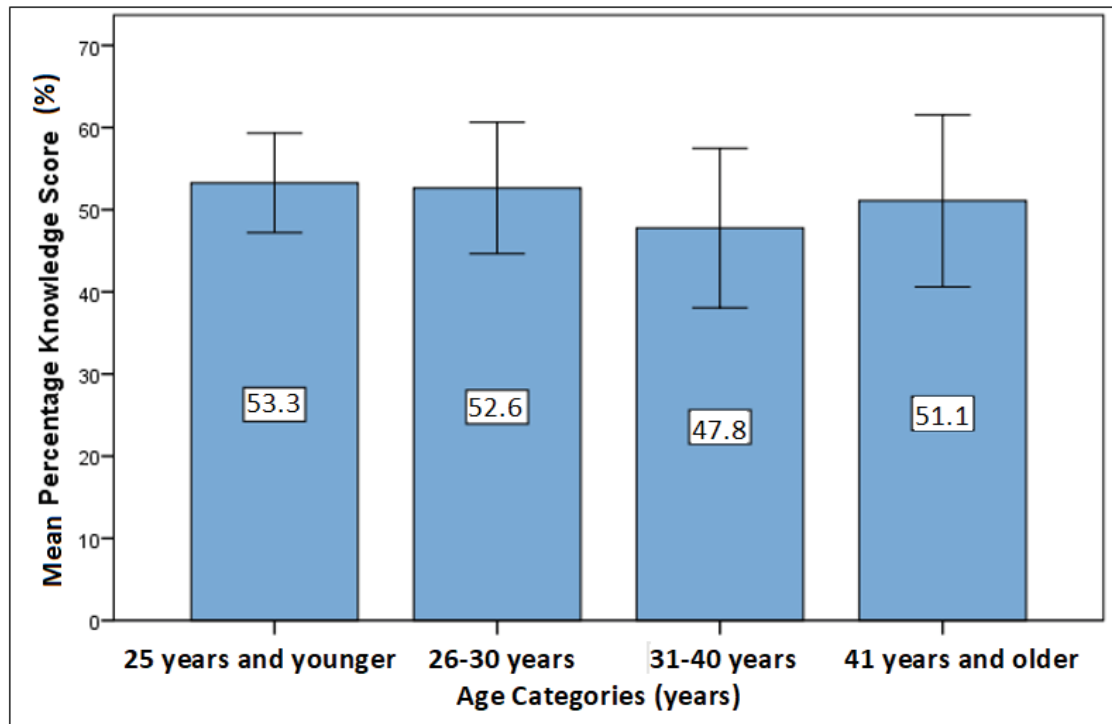
Figure 4.2: **Mean percentage malnutrition knowledge scores across the nurses' age categories.**

A p-value of 0.754 was obtained when comparing the mean percentage knowledge scores on malnutrition in older persons, across the different age categories of nurses who took part in this study (Table 4.4). Therefore, the null hypothesis specifying that the nurses' mean percentage knowledge score on malnutrition in older persons varied marginally between the different age categories of nurses, was accepted.

Table 4.4: **Association between the age categories of nurses and their mean percentage knowledge scores.**

Age Categories	Sample size	Mean Percentage Knowledge Score	Std. Deviation	p-value
25 years and younger	34	53.25	17.324	0.754
26-30 years	28	52.63	20.609	
31-40 years	26	47.77	24.000	
41 years and older	17	51.08	20.364	

4.2.5 Nurses' Gender and Mean Percentage Malnutrition Knowledge Scores

As seen in Figure 4.3, female nurses scored higher than their male counterparts on the KoM-G questionnaire, with a mean score of 51.8% (SD 19.1) for female nurses, compared to 50.3% (SD 23.9) for their male counterparts.
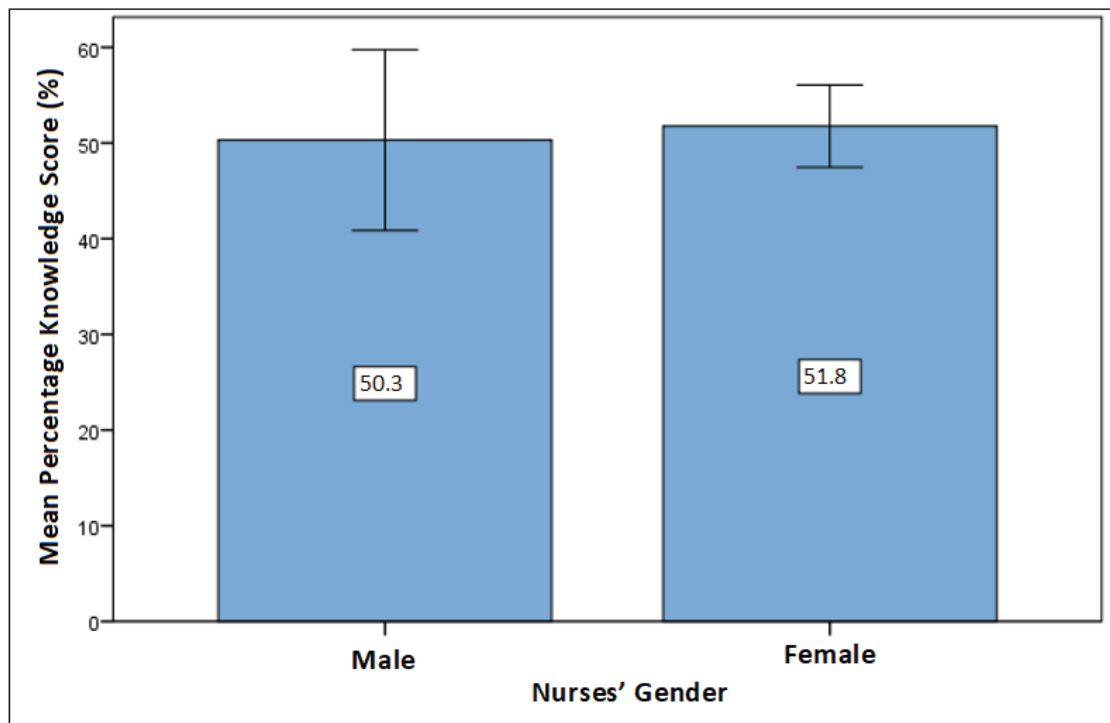
Figure 4.3: **Mean percentage malnutrition knowledge scores across the nurses' gender.**
The error bar graph displayed the 95% confidence interval of the actual mean percentage knowledge scores, if the whole target nursing population at KGRH took part in the study. The fact that the two confidence intervals overlapped considerably complements the results of the Independent Samples t-test which generalised that there is no significant gender discrepancy in the mean percentage knowledge score on malnutrition n older persons, in nurses working at KGRH.

The difference between the mean percentage knowledge score of female and male nurses amounted to 1.5%. When the Independent Samples t-test was used to test for difference in mean percentage malnutrition knowledge score between the nurses' gender, a p-value of 0.749 was obtained (Table 4.5). Therefore, H_o was accepted, demonstrating that there was no significant difference in the nurses' mean percentage knowledge score on malnutrition in older persons across the male and female gender.

Table 4.5:   Association between the gender of the nurses and their mean percentage knowledge scores.

Gender	Sample size	Mean Percentage Knowledge Score	Std. Deviation	p-value
Male	27	50.29	23.867	0.749
Female	2878	51.75	19.088	

4.2.6 Years of Nursing Experience and Mean Percentage Malnutrition Knowledge Scores

Figure 4.4 shows that nurses with 6 to 10 years nursing experience had the highest mean percentage knowledge score on malnutrition in older persons (54.3%). These were followed by nurses with 11 years and more nursing experience (51.3%) and then nurses with 5 years and less of nursing experience (49.7%).
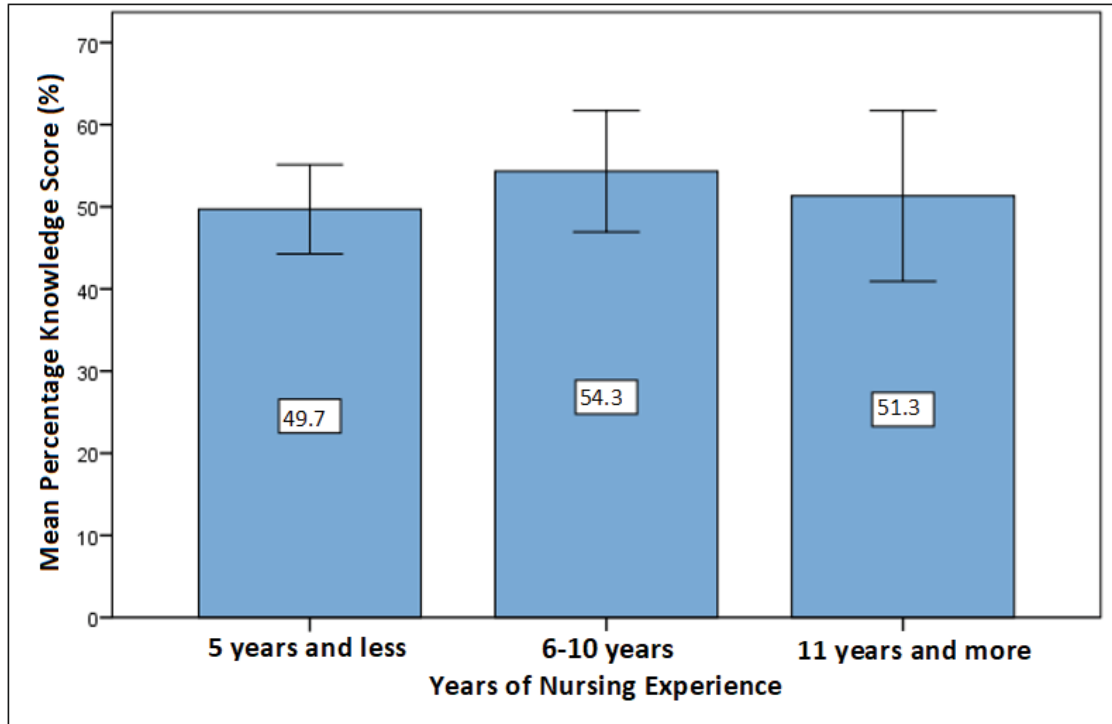
Figure 4.4: **Mean percentage malnutrition knowledge scores across the years of nursing experience.**

The one-way ANOVA test showed a p-value of 0.605 for mean percentage malnutrition knowledge score of nurses across the three different categories of years of nursing experience (5 years and less, 6 to 10 years, 11 years and more) (Table 4.6). Since, the p-value exceeded the 0.05 criterion, H_o was accepted. This meant that the mean percentage knowledge score on malnutrition in older persons, of nurses working at KGRH, varied marginally between the groups of years of nursing experience.

Table 4.6: **Association between the years of nursing experience and their mean percentage knowledge scores.**

Years of Nursing Experience	Sample size	Mean Percentage Knowledge Score	Std. Deviation	p-value
5 years and less	54	49.71	19.895	0.605
6-10 years	31	54.33	20.128	
11 years and more	20	51.32	22.191	

4.2.7 Nurses' Highest Academic Qualification and Mean Percentage Malnutrition Knowledge Scores

The mean percentage knowledge score on malnutrition in the older persons, for nurses with a Degree/Master level of qualification was 55.6%. This exceeded the mean percentage malnutrition knowledge score for their nursing counterparts having a Certificate/Diploma level of qualification, who obtained an overall mean score of 48.5% (Figure 4.5).
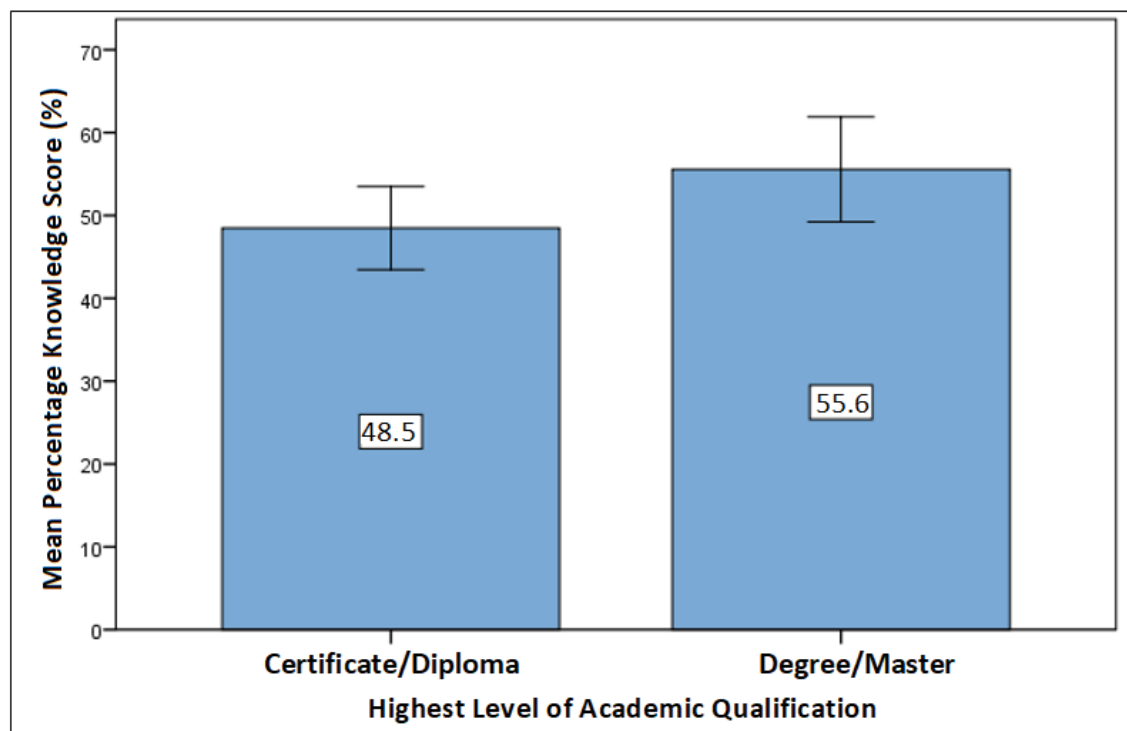
Figure 4.5: Mean percentage malnutrition knowledge scores across the nurses' highest level of academic qualification.

The 7.1% difference in mean percentage malnutrition knowledge score between the nurses having a Degree/Master and those having a Certificate/Diploma level of academic qualification, was almost significant since the p-value stood at 0.078 (Table 4.7). Thus, it exceeded the 0.05 level of significance by a small margin. However, H_o was accepted, concluding that the difference between the mean percentage malnutrition knowledge score of nurses having their highest level of academic qualification at Certificate/ Diploma level and those having a Degree/Master level of qualification was not significant.

Table 4.7: **Association between the highest academic qualification of nurses and their mean percentage knowledge scores.**

Highest Academic Qualification	Sample size	Mean Percentage Knowledge Score	Std. Deviation	p-value
Certificate/Diploma	62	48.47	19.765	0.078
Degree/Masters	43	55.57	20.587	

4.3 FINDINGS PART 2… OLDER PERSONS

During the data collection period, there were 174 new admissions to KGRH. From these admissions 16 persons were excluded from the study as they were younger than 65 years. From the eligible 158 older persons, 8 refused to participate in the study. A total of 150 older persons/relatives/guardians consented to participate in the study, leading to a participation rate of 94.9%.

4.3.1 Characteristics of the Older Persons Cohort admitted at KGRH

Fifty-five of the older persons (36.7%) were male and ninety-five (63.3%) were female. Their mean age was of 81.3 years (SD 7.03) (Table 4.8). For statistical analysis, the age of older persons was categorised into 4 groups (65-75 years, 76-80 years, 81-85 years and 86-100 years). The majority of the older persons (*n*= 84, 56.0%) had a MNA-SF score of 8-11 upon admission to KGRH. An additional thirty-seven older persons (24.7%) scored between 0-7 on the MNA-SF and a minority of twenty-nine older persons (19.3%) scored 12-14 on the same malnutrition screening tool.

Table 4.8: **Characteristics of the older persons who participated in the study.**

Characteristic	*N* (150) Number of participant*s* *n* (%)
Gender	
Male	55 (36.7%)
Female	95 (63.3%)
Age (years)	
65-75	32 (21.3%)
76-80	33 (22.0%)
81-85	45 (30.0%)
86-100	40 (26.7%)
MNA-SF Score	
0-7	37 (24.7%)
8-11	84 (56.0%)
12-14	29 (19.3%)

4.3.2 Prevalence of Risk of Malnutrition in the Older Persons on Admission to KGRH

As explained in the previous chapters (Section 2.5, 3.8, 3.11) a score between 0-11 on the MNA-SF was used as the basis to identify older persons at risk of malnutrition, upon admission to KGRH. Whilst an MNA-SF score of 12-14 signified a normal nutritional status. This implied that 121 older persons from the total cohort of 150 older persons, aged 65 years or older, were at risk of malnutrition upon admission to KGRH (Table 4.8). This indicated a prevalence of risk of malnutrition in the older persons, upon admission to KGRH of 80.7%.

4.3.3 Hypotheses Testing for Association between Independent Variables and Risk of Malnutrition in Older Persons

The Chi-Square test was used to assess the association between two categorical variables. These variables provided information on the older persons and consisted of the (a) nutritional status (at risk of malnutrition, normal nutritional status) upon admission to

KGRH, (b) age categories (65 to 75 years, 76 to 80 years, 81 to 85 years, 86 to 100 years), (c) gender (male, female), (d) MNA-SF score categories (0-7, 8-11) and (e) referral to the Department of Nutrition and Dietetics (DND) for malnutrition assessment and management (referred, not referred).

H_o specified that there was no association between the two categorical variables and was accepted if the p-value exceeded the 0.05 level of significance. H_1 specified that there was a significant association between the two variables and was accepted if the p-value was less than 0.05 criterion.

4.3.4 Older Persons' Age and Nutritional Status

Figure 4.6 shows that in all the age categories, the majority of older persons were at risk of malnutrition upon admission to KGRH. Additionally, there was a tendency that with increasing age, the number of older persons at risk of malnutrition increased and those with normal nutritional status decreased. In fact, 90.0% of older persons aged 86-100 years were found to be at risk of malnutrition upon admission to KGRH, whilst 75.0% of older persons aged 65-75 years had the same risk.
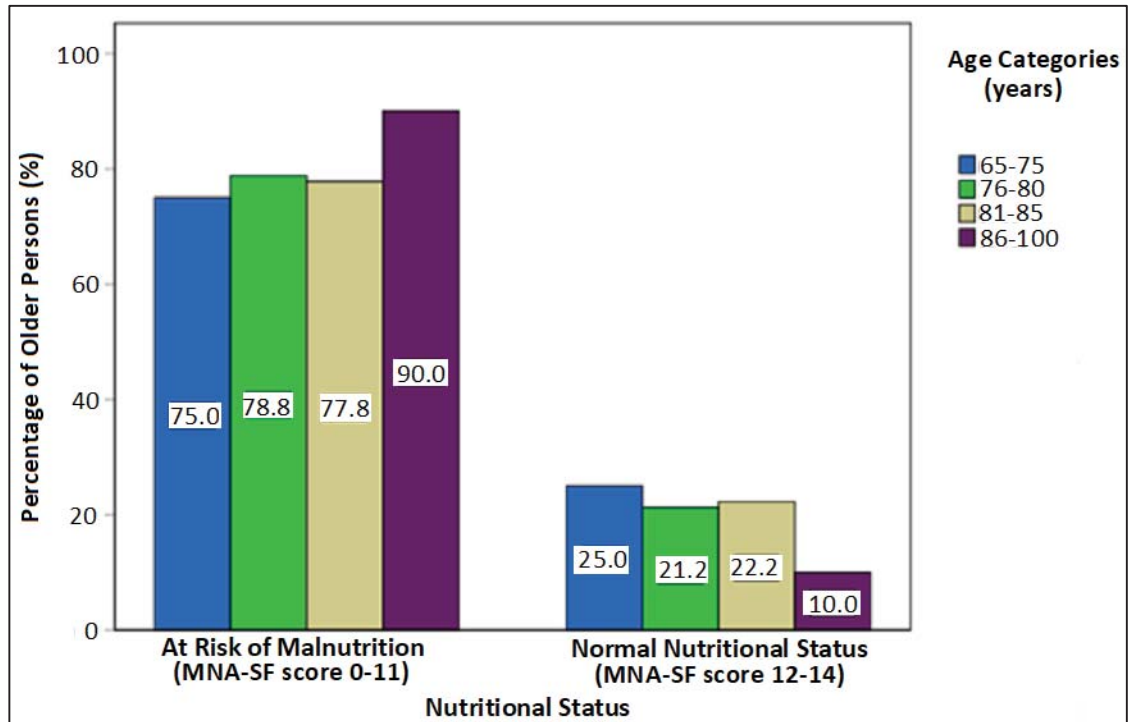
Figure 4.6: **Percentage of older persons, clustered by age categories and their nutritional status upon admission to KGRH.**

At risk of malnutrition was determined as an MNA-SF score of 0-11 and a normal nutritional status as an MNA-SF score of 12-14.

However, a p-value of 0.361 was obtained when testing the association between the age categories of the older persons and their nutritional status (Table 4.9). Thus, H_o was accepted, meaning that the age of the older persons admitted at KGRH was not associated with their nutritional status.

Table 4.9:   **Association between the older persons' age category and their nutritional status upon admission to KGRH.**

The obtained Chi Square value of 3.209 is smaller than the 7.82 critical Chi Square value at 3 degree of freedom at a probability level of p=0.05. Thus, the null hypothesis cannot be rejected.

| | | | Age Categories (years) | | | | |
			65-75	76-80	81-85	86-100	Total
Nutrition Status	At Risk of Malnutrition	Number of older persons	24	26	35	36	121
		Percentage	75.0%	78.8%	77.8%	90.0%	80.7%
	Normal Nutritional Status	Number of older persons	8	7	10	4	29
		Percentage	25.0%	21.2%	22.2%	10.0%	19.3%
Total		Number of older persons	32	33	45	40	150
		Percentage	100.0%	100.0%	100.0%	100.0%	100.0%

$X^2(3) = 3.209$, p= 0.361

4.3.5 Older Persons' Gender and Nutritional Status

The findings from this study showed that irrespective of their gender (male, female), the majority of the older persons who participated in this study were at risk of malnutrition. In fact, 82.1% of the females and 78.2% of the males were at risk of malnutrition upon admission to KGRH. This meant that there were 4.1% more female older persons when compared to male older persons, who were at risk of malnutrition upon admission to KGRH (Figure 4.7).
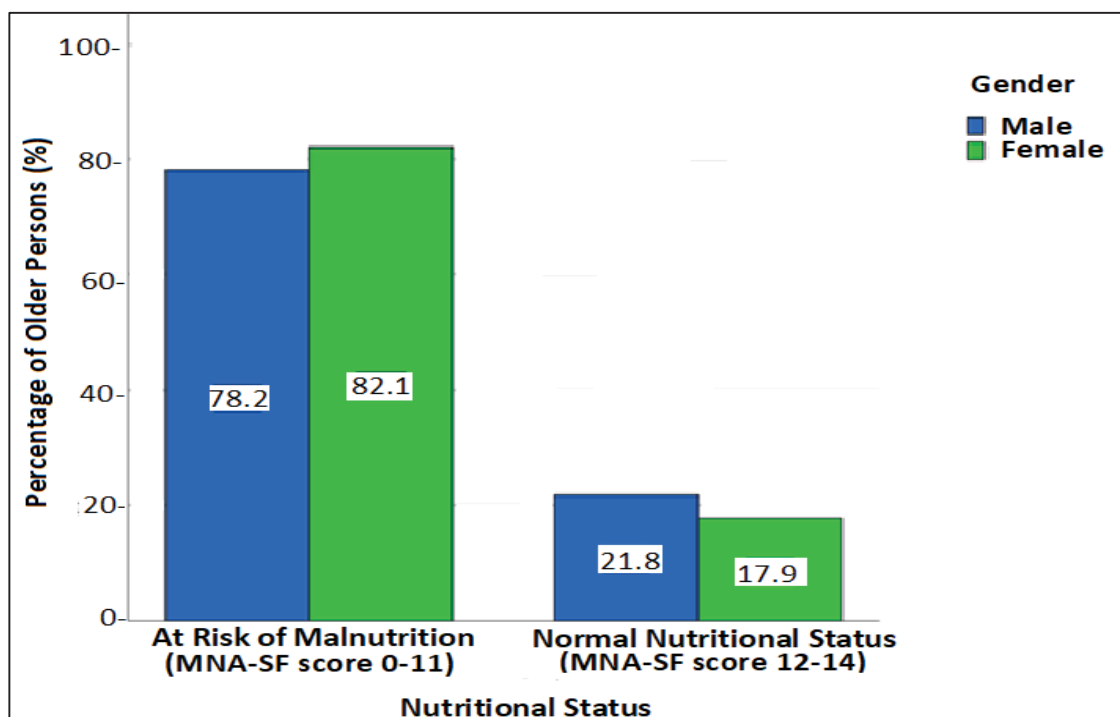
Figure 4.7: **Percentage of older persons, clustered by gender and their nutritional status upon admission to KGRH.**

At risk of malnutrition was determined as an MNA-SF score of 0-11 and a normal nutritional status as an MNA-SF score of 12-14.

Chi-Square test showed a p-value of 0.558 for the association between the gender of the older persons and their nutritional status upon admission to KGRH (Table 4.10). As the p value was higher than the 0.05 criterion, H_o was accepted. Therefore, there was no association between the gender of the older persons and their nutritional status upon admission to KGRH.

Table 4.10:   **Association between the older persons' gender and their nutritional status upon admission to KGRH.**

The obtained Chi Square value of 0.344 is smaller than the 3.84 critical Chi Square value at 1 degree of freedom at a probability level of p=0.05. Thus the null hypothesis cannot be rejected.

| | | | Gender of older persons admitted at KGRH | | Total |
			Male	Female	
Nutrition Status	At Risk of Malnutrition	Number of older persons	43	78	121
		% within Gender	78.2%	82.1%	80.7%
	Well nourished	Number of older persons	12	17	29
		% within Gender	21.8%	17.9%	19.3%
Total		Number of older persons	55	95	150
		% within Gender	100.0%	100.0%	100.0%

$X^2(1) = 0.344$, p= 0.558

4.4   REFERRAL   TO   THE   DND   FOR   MALNUTRITION ASSESSMENT AND MANAGEMENT

Of the 121 older persons found to be at risk of malnutrition upon admission to KGRH, 61 older persons (50.4%) were referred to the DND for malnutrition assessment and management. Additionally, 3 of the 29 older persons who had normal nutritional status were also referred to the DND for malnutrition assessment and management (This will be explored in the discussion chapter).

4.4.1 Age of the Older Persons' at Risk of Malnutrition and Referral to the DND for Malnutrition Assessment and Management

Figure 4.8 shows that there was a general trend indicating that with increasing age (65-75 years to 81-85 years) of the older persons found to be at risk of malnutrition, a greater percentage of them were referred to the DND, for malnutrition assessment and management (37.5% for age category 65-75 years vs 57.1% for age category 81-85 years). However, this trend was not sustained for the oldest-old age category (86- 100 years), were 50% (*n* =18) of these old persons found at risk of malnutrition, were referred to the DND for malnutrition assessment and management.

It was also noted that for the younger age category (65-75 years), unlike for the rest of the age categories, the percentage of older persons found at risk of malnutrition but not referred (62.5%) to the DND, for malnutrition assessment and management, outnumbered those referred (37.5%).
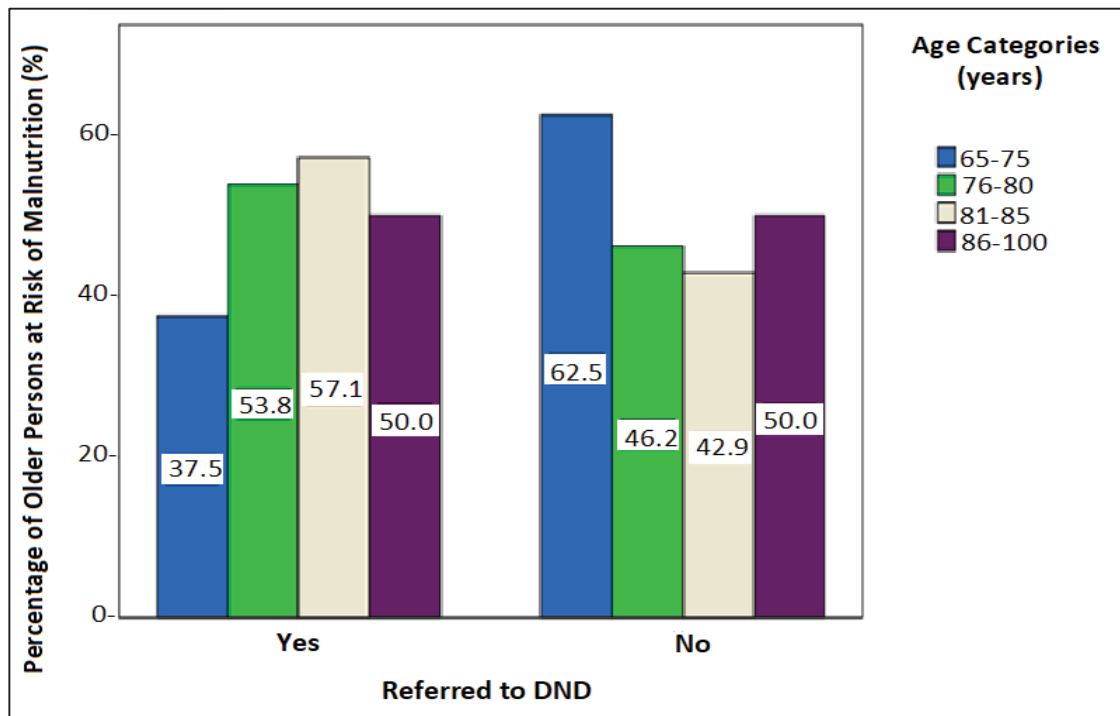
Figure 4.8: Percentage of older persons found at risk of malnutrition upon admission to KGRH clustered by age categories and whether referred or otherwise to the DND within KGRH.

Chi-Square test to determine if there was an association between the age category of the older persons at risk of malnutrition, upon admission to KGRH, and referral or otherwise to the DND for malnutrition assessment and management obtained a p-value of 0.501 (Table 4.11). Since the p-value exceeded the 0.05 level of significance, H_o was accepted. Specifying, no association between the age category of the older persons at risk of malnutrition, upon admission to KGRH, and being referred or otherwise to the DND for malnutrition assessment and management, was accepted.

Table 4.11: Association between the age categories of the older persons at risk of malnutrition and the referral or otherwise to the DND for malnutrition assessment and management.

The obtained Chi Square value of 2.360 is smaller than the 7.82 critical Chi Square value at 3 degree of freedom at a probability level of p=0.05. Thus the null hypothesis cannot be rejected.

			Age Categories (years) for older persons found at risk of malnutrition				Total
			65-75	76-80	81-85	86-100	
Referred to DND	Yes	Number of older persons	9	14	20	18	61
		Percentage	37.5%	53.8%	57.1%	50.0%	50.4%
	No	Number of older persons	15	12	15	18	60
		Percentage	62.5%	46.2%	42.9%	50.0%	49.6%
Total		Number of older persons	24	26	35	36	121
		Percentage	100.0%	100.0%	100.0%	100.0%	100.0%

$X^2(3) = 2.360$, p= 0.501

4.4.2 Gender of the Older Persons' at Risk of Malnutrition and Referral to the DND for Malnutrition Assessment and Management

Out of the 121 older persons admitted to KGRH and found to be at risk of malnutrition, 22 males (51.2%) and 39 females (50.0%) were referred to the DND for malnutrition assessment and management (Figure 4.9).
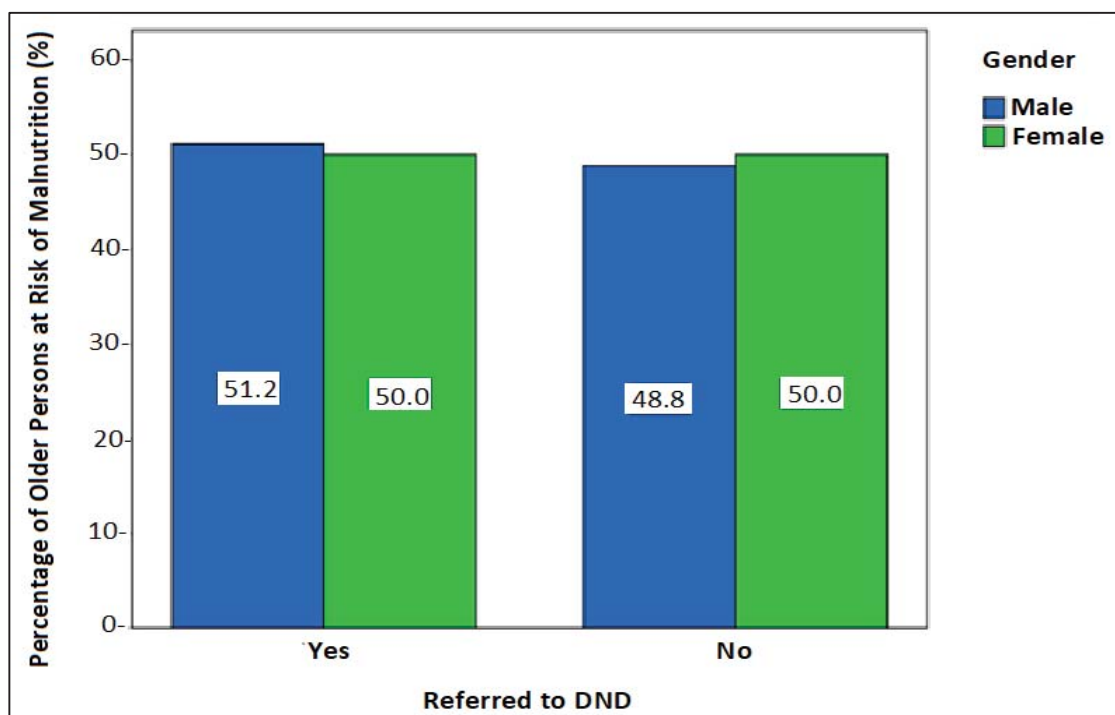
Figure 4.9: **Percentage of older persons found at risk of malnutrition upon admission to KGRH clustered by gender and whether referred or otherwise to the DND within KGRH.**

H_o specifying no association between gender of older persons at risk of malnutrition and referral to the DND for malnutrition assessment and management was accepted, as Chi-Square analysis indicated a p-value of 0.903 (Table 4.12).

Table 4.12: **Association between the gender categories of the older persons at risk of malnutrition and the referral or otherwise to the DND for malnutrition assessment and management.**

The obtained Chi Square value of 0.015 is smaller than the 3.84 critical Chi Square value at 1 degree of freedom at a probability level of p=0.05. Thus the null hypothesis cannot be rejected.

			Gender categories of older persons found at risk of malnutrition		
			Male	Female	Total
Referred to DND	Yes	Number of older persons	22	39	61
		Percentage	51.2%	50.0%	50.4%
	No	Number of older persons	21	39	60
		Percentage	48.8%	50.0%	49.6%
Total		Number of older persons	43	78	121
		Percentage	100.0%	100.0%	100.0%

$X^2(1) = 0.015$, p = 0.903

4.4.3 MNA-SF Score Category of the Older Persons' at Risk of Malnutrition and Referral to the DND for Malnutrition Assessment and Management

Figure 4.10 shows that from the older persons found to be at risk of malnutrition, upon admission to KGRH, a greater percentage of those with a lower MNA-SF score category (0-7) were referred to the DND for malnutrition assessment and management ($n= 21$, 56.8%), in comparison to those who scored 8-11 on the same tool ($n= 40$, 47.6%).
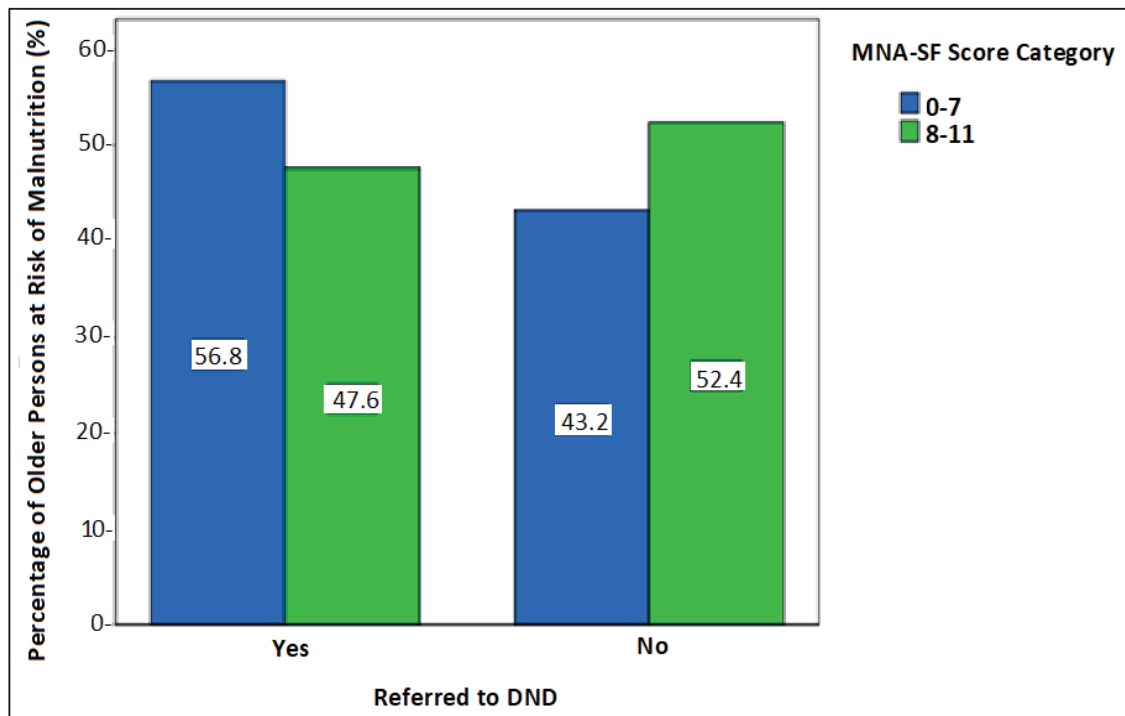
Figure 4.10: Percentage of older persons found at risk of malnutrition upon admission to KGRH clustered by MNA-SF score category and whether referred or otherwise to the DND within KGRH .

Whilst both MNA-SF score categories of 0-7 and 8-11 indicate risk of malnutrition in the older persons, a score of 0-7 indicates a high risk in comparison to a score of 8-11.

The Chi-Square test showed a p-value of 0.354 for the association between level of risk of malnutrition (MNA-SF score 0-7 and 8-12) and being referred or otherwise to the DND, for malnutrition assessment and management (Table 4.13). Since the p-value was higher than the 0.05 criterion, H_o was accepted. Thus, there was no association between, the MNA-SF score category of the older persons found at risk of malnutrition,

upon admission to KGRH and whether they were referred or otherwise to the DND for malnutrition assessment and management.

Table 4.13: Association between the MNA-SF score categories of the older persons at risk of malnutrition and the referral or otherwise to the DND for malnutrition assessment and management.

The obtained Chi Square value of 0.858 is smaller than the 3.84 critical Chi Square value at 1 degree of freedom and a probability level of p=0.05. Thus the null hypothesis cannot be rejected.

			MNA-SF score category of older persons found at risk of malnutrition		
			0-7	8-11	Total
Referred to DND	Yes	Number of older persons	21	40	61
		Percentage	56.8%	47.6%	50.4%
	No	Number of older persons	16	44	60
		Percentage	43.2%	52.4%	49.6%
Total		Number of older persons	37	84	121
		Percentage	100.0%	100.0%	100.0%

$X^2(1) = 0.858$, p= 0.354

4.5 CONCLUSION

The findings from this research study were presented in this chapter. Through these findings, the aims and objectives of this study were fulfilled.

It was calculated that the mean knowledge score of nurses working at KGRH on malnutrition in older persons was 51.3%. There was no association between the mean percentage knowledge score of nurses and their (a) age, (b) gender, (c) years of nursing experience or (d) their highest level of academic qualifications.

The prevalence of, risk of malnutrition of older persons, upon their admission to KGRH stood at 80.7%. Tests indicated that there was no association between the nutritional status of the older persons and their age or gender.

From the 121 older persons at risk of malnutrition, 50.4% were referred to the DND for malnutrition assessment and management. For the older persons at risk of malnutrition, there was no association between their (a) age, (b) gender or (c) MNA-SF score category and whether they were referred to the DND for malnutrition assessment and management or otherwise.

These findings will be discussed in the next chapter, where they will be compared with findings in studies within international fora.

CHAPTER 5
DISCUSSION

5.1 INTRODUCTION

The aims of this study were to, (a) determine the knowledge on malnutrition in older persons, of nurses working at KGRH, (b) establish the prevalence of risk of malnutrition in older persons, upon admission to KGRH and (c) determine the referral rate of older persons identified as at risk of malnutrition upon admission to KGRH, to the DND for malnutrition assessment and management. A quantitative research methodology design was used. The first part of the study involved nurses at KGRH. Nurses were required to fill a self-administered questionnaire, to establish their knowledge on malnutrition in older persons. The second part of the study, involved content analysis of the medical notes of the older persons, admitted to KGRH over a two-month period. The older persons' risk of malnutrition, age, gender and referral or otherwise to the DND for malnutrition assessment and management were collated.

This chapter will interpret the findings from this study. The findings will also be discussed and compared to findings from international research studies, which were referred to in the literature review. The chapter will be divided into two parts. Part one will discuss the findings vis-à-vis the nurses' knowledge on malnutrition in older persons. Part two will discuss the findings apropos the risk of malnutrition in older persons.

This chapter will conclude with a discussion on the limitation and contributions of this study.

5.2 PART 1…NURSES' KNOWLEDGE ON MALNUTRITION IN OLDER PERSONS

This section will discuss the knowledge base of nurses working at KGRH, regarding malnutrition in older persons. Internationally, this study was one amongst a few which, determined the knowledge of nurses regarding malnutrition in older persons.

5.2.1 Nursing Participation in this Study

With the intent to achieve generalised results, the target nursing population meeting the inclusion criteria was invited to participate in the study. This led to 105 nurses returning the self-administered KoM-G questionnaire together with the demographics questionnaire. A response rate of 72.9% was achieved. This response was high when compared to other rates from similar studies, which ranged between 26.5% to 59.5% (Bauer et al., 2015; Beattie et al., 2013; Crogan et al., 2001; Endevelt et al., 2009). As the researcher did not retrieve any study on the knowledge of nurses on malnutrition in older persons in Malta, it could probably have been the first time that nurses were asked to participate in a survey on this topic. Potentially, this could have generated interest in the nurses and contributed to a high response rate. However, the achieved rate in this study was lower than that by Boaz et al. (2013) which stood at 100%.

5.2.2 Nurses' Knowledge on Malnutrition

The nurses' knowledge on malnutrition in older persons, was explored through the KoM-G questionnaire. Their knowledge, stood at a mean of 51.3%. This is similar to the mean knowledge score obtained by nurse, on nutrition in older persons, in the studies carried out by Beattie et al. (2013) and Boaz et al. (2013), which was 55.1% and 51.9% respectively. Similarly, in a local study, Fiorini (2007) found that the mean knowledge of nurses was 52.9%. However, in the latter study, the questionnaire did not focus on the nutrition of older persons but on general nutrition knowledge. Furthermore, only 15 nurses, recruited through convenience sampling participated in that study. These, limited the generalisability of the findings in the study by Fiorini (2007).

In comparison to the present study, a higher mean knowledge score by nurses, on nutrition in older persons, was obtained by Crogan et al. (2001) and Endevelt et al. (2009), where the mean knowledge score was 65.0% and 69.0% respectively. However, it is worth nothing that only 34.0% of the questions in the study by Crogan et al. (2001) had a level of complexity judged by a panel of experts, to be equivalent to level 5 and 6 on a 6 levels scale. Where level 6 denoted the most difficult questions. Hence, the majority of the questions in the study by Crogan et al. (2001) had a low level of complexity. Potentially

contributing towards a higher mean knowledge score by nurses in the Crogan et al. (2001) study, when compared to this study.

Additionally, the questionnaire which was used to measure the knowledge of nurses on nutrition in older persons, in the study by Endevelt et al. (2009) was not tested for validity. As such, one cannot be certain that the used tool stood up for its intended purpose. Moreover, the study by Endevelt et al. (2009), had a low response rate of 26.0%, which was not representative of the target population. These might have led to a higher mean nutrition knowledge score by nurses when measured against this study.

Unlike the studies by Beattie et al. (2013), Boaz et al. (2013), Crogan et al. (2001) and Endevelt et al. (2009), the present study was specific on older persons' malnutrition, rather than on older persons' nutrition. This could have rendered the KoM-G questionnaire, used in this study, to be more challenging when compared to questionnaires in the aforementioned studies. Leading to a lower mean knowledge score for nurses observed in this study.

Nevertheless, it remains a fact that the mean knowledge score by nurses at KGRH, was 14.2% less than that obtained by nurses in the study by Bauer et al. (2015). Where both studies used the same questionnaire to measure the knowledge of nurses on malnutrition in older persons. A possible reason for this could be that nurses working at KGRH received less formal training on malnutrition than the participants in the study by Bauer et al. (2015). Where the latter reported that 29.7% of the nursing participants received additional training specifically on malnutrition. This aspect was not investigated in this study (it will be discussed in the limitations Section 5.4). Moreover, Bauer et al. (2015) reported that the potential nursing participants were chosen at the discretion of the nursing directors. Hence, leading towards a bias, where more knowledgeable nurses or those more interested in the topic, might have been chosen to compile the questionnaire tool. This paid towards a potential increase in the mean knowledge score.

The nursing participants in both this study and the one by Bauer et al. (2015) were knowledgeable on the a) consequences associated with malnutrition (88.1% and 74.3% respectively), b) signs of dehydration (86.9% and 78.1% respectively), c) components of nutritional screening (71.4% and 70.5% respectively) and d) nutrient needed for wound healing (83.6% and 95.2% respectively). Likewise, both nursing cohorts were least knowledgeable on the a) normal/healthy Body Mass Index of older persons (36.2% and 21.0% respectively) b) professions which should be involved when a person is found malnourished (33.1% and 41.9% respectively) c) utility of recording the food and fluid intake (42.4% and 46.7% respectively) and d) when tube feeding is appropriate (38.3% and 29.5% respectively) (Table 4.2).

In contrast, whilst the majority of the nurses (80.6%) in the study by Bauer et al. (2015) were knowledgeable on the possible risk factors for malnutrition, only 50.5% of nurses in the current study managed to identify these factors (Table 4.2). Additionally, contrasting the 55.7% of nurses in the study by Bauer et al. (2015), this study showed that only 27.6% of nurses were aware that 5% to 10% unintentional body weight loss in three months, could be a possible sign of malnutrition in older persons. Likewise, fewer nurses in the current study (18.1%), when compared to those in the study by Bauer et al. (2015) (46.0%), were aware that older persons required less calorie intake, when compared to younger adult persons (Table 4.2).

Moreover, Bauer et al. (2015) established that 90.5% of nurses were knowledgeable on the factors which could positively affect oral intake (providing the food the person likes, eating in company of other persons, avoiding interruptions and offering help to feed). Only 57.1% of nurses within this local study recognised such factors. This can lead to nurses at KGRH not implementing ways to improve the nutritional status of the older persons. Furthermore, 64.8% of nurses who took part in this study recognised the factors which could negatively influence nutritional intake (offering unfamiliar food, interruptions during meals, poorly fitting dentures, pain and isolation). This opposing to 88.3% of nurses in the study by Bauer et al. (2015), who recognised such factors. As such, nurses working at KGRH might not implement ways to mitigate these negative

factors. So, the nutritional status of the older person can deteriorate further. Leading to an exacerbation of risk of malnutrition.

It seems that nurses are knowledgeable on aspects of malnutrition in older persons which they can visually assess, like the a) component of malnutrition screening tool, b) signs of dehydration and c) consequences of malnutrition (Table 4.2). They lack knowledge on less evident aspects on malnutrition such as the a) nutrient requirements, b) risk factors of malnutrition, c) actions to prevent and improve malnutrition and d) professionals required to improve the nutritional status of the older person (Table 4.2).

Lack of knowledge might hinder nurses' ability in identifying older persons who would be at risk of malnutrition. As a result, during their stay at KGRH the nutritional status of older persons might deteriorate further. However, as most nurses at KGRH were knowledgeable on the signs and consequences of malnutrition, these could serve as a trigger to improve the nutritional status of older persons' with malnutrition. Yet, these actions might be limited as many nurses lacked knowledge on ways to improve the older persons' nutritional status. Adding to the problem is the fact that the majority of the nurses at KGRH where not in a position to recognise which professional individuals to engage in treating malnutrition in older persons. These results shed light on the importance of ameliorating the knowledge of nurses on the topic of malnutrition, which will be discussed in chapter six.

5.2.3 Association between Nurses' Characteristics and their Knowledge on Malnutrition

In this study, it was noted that the younger nurses in the age brackets 25 years and younger and 26 to 30 years, had a higher mean knowledge score (53.3% and 52.6% respectively) than their colleagues aged 31 to 40 and 41 years and older (47.8% and 51.1% respectively) (Figure 4.2). As older nurses are generally regarded by younger nurses as being more seasoned in experience (Crogan & Evans, 2001), it could happen that their misconceptions on malnutrition in older persons is conveyed to the younger nurses' generation. Nonetheless, in this study, the difference in the knowledge score of nurses,

across the age groups was not significant (p= 0.754) (Table 4.4). This finding is consistent with results from the studies by Bauer et al. (2015) Beattie et al. (2013) and Boaz et al. (2013). However, it is contrary to the finding by Endevelt et al. (2009), where nurses younger than 40 years had significantly higher knowledge on nutrition than nurses who were older.

Just like Bauer et al. (2015), Beattie et al. (2013) and Boaz et al. (2013), this study did not find any association between the nurses' gender and their mean knowledge score on malnutrition in older persons. In fact, the results in this study indicated that the mean knowledge score on malnutrition in older persons was 51.8% for female nurses and 50.3% for their male counterparts (Figure 4.3).

The association between the years of nursing experience and the mean knowledge of nurses on malnutrition in older persons was also explored. In line with the studies by Bauer et al. (2015), Beattie et al. (2013), Boaz et al. (2013) and Crogan et al. (2001), this study showed that there was no significant association between the years of nursing experience and the mean knowledge of nurses on malnutrition in older persons (Table 4.6). Despite this lack of association, it was observed that nurses with five years or less of nursing experience, had a lower mean knowledge score (49.7%) than nurses with 6 to 10 years experience (54.3%) or 11 years and more (51.3%) (Figure 4.4) Possibly, nurses who had been longer in the nursing profession were more aware of malnutrition issues, gained through practical experience. Alternatively, some nurses with more years in the profession might have followed continuous development courses on the topic, leading to greater knowledge.

Furthermore, this study showed that nurses working at KGRH whose highest academic level consisted of a Degree or Master qualification, had a higher mean knowledge score on malnutrition in older persons (55.6%), than nurses whose highest level of academic qualification was at a Certificate or Diploma levels (48.5%) (Figure 4.5). However, this association was not significant (p= 0.078) (Table 4.7). This same trend was also noted in the findings by Beattie et al. (2013), which again resulted in no statistical significant level

of association. Whilst Boaz et al. (2013) further confirmed the lack of association between the nurses' knowledge on nutrition and level of qualifications.

The noted higher level of knowledge in this study by nurses having higher qualifications could be attributed to more hours on nutrition in the curriculum leading to a Degree or Master in Nursing versus the Certificate and Diploma courses. In fact, at the University of Malta, 30 hours of lectures on nutrition are delivered to students reading for the Degree in Nursing, as opposed to 10 hours offered at Diploma level (S. Ebejer & C. Bezzina, personal communication, March, 2019).

5.3   PART 2…RISK OF MALNUTRITION IN OLDER PERSONS

As noted in the literature review, in Malta there is a dearth of information on the prevalence of risk of malnutrition in older persons upon admission to a rehabilitation hospital.

This section will discuss the findings on the prevalence of risk of malnutrition of older persons, upon admission to KGRH. Risk of malnutrition was defined as an MNA-SF score of 0 to 11 (Section 3.5, 3.8). This section will also discuss the lack of statistical association observed between the age or gender of the older persons and their nutritional status. Furthermore, this section looks at the referral rates of older persons, found at risk of malnutrition, to the DND at KGRH, for malnutrition assessment and management. A discussion will ensue regarding the lack of statistical association observed in this study between the age, gender or MNA-SF score category of the older persons, found to be at risk of malnutrition, and referred to the DND.

5.3.1 Prevalence of Risk of Malnutrition in Persons Aged 65 years or Older, upon Admission to KGRH

The prevalence of risk of malnutrition of the 150 older person participants stood at 80.7%. This prevalence was higher than that observed by Hertroijs et al. (2012), Neumann et al.

(2005) and Söderhamn et al, (2007), who reported a prevalence of risk of malnutrition in rehabilitation hospitals of 73.5%, 59.0% and 69.0% respectively.

There are various interpretations why the aforementioned studies established a lower prevalence risk of malnutrition than the present study. The studies conducted by Neumann et al. (2005) and Söderhamn et al. (2007), respectively excluded persons living with dementia and persons with communication difficulty. According to Weekes et al. (2004), these persons have a higher risk of malnutrition, as persons living with dementia might forget to eat and persons with communication difficulty might have decreased ability to communicate that they are hungry. In contrast, this study included such older persons. This, could have contributed to the higher prevalence of risk of malnutrition when compared to the studies by Neumann et al. (2005) and Söderhamn et al. (2007).

Akin to this study, Hertroijs et al. (2012) used the MNA-SF to calculate the prevalence of risk of malnutrition. This screening tool reassures its validity for persons 65 years or over (Academy of Nutrition and Dietetics, 2018). In Hertroijs et al. (2012), 73.5% of the participants were younger than 65 years of age. Therefore, the prevalence of risk of malnutrition in older persons, as measured by Hertroijs et al. (2012) might be erroneous, since the tool used was not validated for all the intended population. Additionally, as concluded by Dominguez (2013), Kettel et al. (2016) and Lazarus and Hamlyn (2005), the risk of malnutrition increases with increasing age. Therefore, the lower age of nearly three-fourths of the participants in the study by Hertoijs et al. (2012) could be another reason for the lower prevalence of risk of malnutrition in their study, when compared to this study.

The prevalence of risk of malnutrition of 80.7% obtained through this study was in line with that established by Shiraishi et al. (2017) and Slattery et al. (2015), who established this to be 84.2% and 78.0% respectively. Similar to this study, Shiraishi et al. (2017) and Slattery et al. (2015) screened older persons upon admission, using the MNA-SF malnutrition screening tool. Likewise, in all the three studies, the only exclusion criteria for older persons to participate in the study was a chronological age younger than 65

years. These similarities in the three cohorts might have been major reasons for obtaining similar prevalence rates for risk of malnutrition in older persons upon admission to a rehabilitation hospital.

Contrasting the 80.7% prevalence of risk of malnutrition in older persons upon admission to KGRH observed in the present study, the studies conducted by Beck et al. (2001), Charlton et al. (2010), Kaiser et al. (2011), Sánchez-Rodríguez et al. (2017) and Wakabayashi and Sashika (2014) observed a higher prevalence rate. These ranged between 86.0% to 100% (Table 2.7).

Whilst the prevalence of risk of malnutrition in older persons could be higher in other rehabilitation hospitals than that observed at KGRH, one has to take a deeper look at how the studies were conducted. A different study design, participants' selection criteria or the characteristics of the older persons' cohort, such as their mean age or degree of frailty, could potentially have contributed to a higher prevalence of risk of malnutrition observed in the quoted studies. The study by Sánchez-Rodríguez et al. (2017) included only persons aged 70 years and over, whilst the present study also included persons in the age range 65 to 69 years. The mean age of the older persons who participated in the present study was 81.3 years whilst that in the study by Sánchez-Rodríguez et al. (2017) was 84.5 years. As mentioned previously, studies found that with increasing age, the risk of malnutrition increased (Agarwal et al., 2012; Dominguez, 2013; Kettell et al., 2016; Söderhamn et al., 2007; Vanderwee et al., 2011; Velasco-Rodriguez et al., 2015; Wakabayashi & Sashika, 2014). Therefore, a higher mean age and exclusion of persons younger than 70 years, could have contributed to a prevalence risk of malnutrition of 100% in the study by Sánchez-Rodríguez et al. (2017).

Moreover, the sample size of the older persons in the studies by Kaiser et al. (2011) and Sánchez-Rodríguez et al. (2017) were relatively small standing at 98 and 95 older persons respectively. This limited the representativeness of the sample and thus the true prevalence of risk of malnutrition of the target older persons' population.

Another potential reason for observing a higher prevalence of risk of malnutrition in the studies by Charlton et al. (2010) and Kaiser et al. (2011) might be due to when the screening was carried out. In the present study, the screening for risk of malnutrition was carried out upon admission of the older persons to KGRH. In the study by Charlton et al. (2010), screening was done 3 days post admission, while Kaiser et al. (2011) did not specify when screening was conducted. When older persons are screened for malnutrition during their hospital stay, rather than upon admission, they would have a higher tendency to screen positively for risk of malnutrition. This, as psychological factors including low mood and delirium, as well as healthcare system factors including, inflexible mealtimes and interruptions during meal times (Table 2.2), could come into play during the older persons' hospital stay. These have been found to decrease the amount of food intake, in turn, increasing the risk of malnutrition (Hickson 2006; Kondrup et al., 2002, Kurack & Jensen, 2007; Mudge et al., 2011; Nieuwenhuizen et al., 2010).

The present study supports local data on prevalence of malnutrition. Koh (2004) concluded that in his convenience sample of 42 older persons, aged 65 years or over, residing in a Maltese nursing home, 9.5% were malnourished and 71.5% were at risk of malnutrition. It has to be noted that the study by Koh used the full version MNA, which is regarded as an assessment tool, unlike the MNA-SF, used in this study, which is a screening tool (Jensen et al., 2012). A screening tool, such as the one used in this study, will identify both persons who are malnourished and those at risk of malnutrition and group them together. Through a malnutrition assessment, then persons can be diagnosed as malnourished or not (Section 2.4, 2.5). Taking both the older persons identified as malnourished (9.5%) and at risk of malnutrition (71.5%) in the study by Koh (2004), it would lead to a prevalence of risk of malnutrition of 81.0%, similar to the 80.7% prevalence of risk of malnutrition found through this study.

However, it is important to note that the study by Koh (2004), unlike this study, excluded older persons who according to Asai (2004) are at high risk of malnutrition. These included older persons on non-oral feeds, those who were unable to give consent and

older persons who were fasting. Had these persons been included in the study by Koh (2004), the prevalence of risk of malnutrition could have been higher.

The prevalence of risk of malnutrition of older persons upon their admission to KGRH, standing at 80.7% as established in this study, was higher than that determined by Zammit (2009) who found that 68.0% had the same risk upon their admission into Maltese acute medical wards. This further supports the conclusion from the study by Kaiser et al. (2010) which stated that the older persons are at higher risk of malnutrition as their dependency of care increase. This is partly due to an increase in the personal, psychological and health care system factors which might cause a decrease in the older persons' nutritional intake (Table 2.2). Thereby, increasing the risk of malnutrition (Stratton et al., 2003).

5.3.2 Association between the Older Persons' Characteristics and their Risk of Malnutrition

This study established that neither the age nor the gender of the older persons, had a statistically significant association with their nutritional status.

Despite the tested association of age of the older persons (64-75 years, 76-80 years, 81-85 years, 86-100 years) and their nutritional status (at risk of malnutrition, normal nutritional status) not achieving statistical significance (p = 0.361) (Table 4.9), this study showed that a greater percentage (90.0%) of old persons within the age category 86-100 years were at risk of malnutrition than younger older person cohorts (75.0% to 77.8%) (Figure 4.6). The lack of association observed in the age categories for being at risk of malnutrition or having normal nutritional status, does not support the findings by Shiraishi et al. (2017) and Söderhamn et al. (2007) who both observed a statistical significant association between a higher age of the older persons and being risk of malnutrition. Similar to this study, Adams et al. (2008) and Gazzotti et al. (2000) did not find any difference in the age of the older persons across the MNA classifications. However, in the latter two studies the older persons were admitted into medical wards, unlike the setting of this study, which was a rehabilitation hospital.

With respect to the association between the gender of the older persons and their nutritional status, the findings from this study showed that 82.1% of older persons at risk of malnutrition were female and 78.2% were male (Figure 4.7). This similar result contributed to the lack of statistical association (p =0.558) observed between the gender and being at risk or otherwise to malnutrition (Table 4.10). This finding supports the studies by Söderhamn et al. (2007) and Wakabayashi and Shiraishi et al. (2017), whose results indicated similar observations. This finding indicates that both male and female older persons are equally at risk of malnutrition upon admission to KGRH.

5.3.3 Referral Rate of Older Persons to the DND for Malnutrition Assessment and Management

Another important objective in this study was to determine the percentage of older persons, found to be at risk of malnutrition, and referred to the DND for malnutrition assessment and management. This was calculated to be 50.4% (61 older persons) from 121 older persons found at risk of malnutrition. This finding is similar to those observed by Neumann et al. (2005) and van Zwienen-Pot et al. (2017), who reported a referral rate of 42.0% and 56.0% respectively. Similar to the present study, these studies took place in a rehabilitation setting and the older persons were assessed for the presence of risk of malnutrition using the MNA-SF. Dent et al. (2018) found a lower referral rate, standing at 38.6%, in a geriatric evaluation and management unit. It is important to note that unlike this study, the studies conducted by Dent et al. (2018), Neumann et al. (2005) and van-Zwienen-Pot et al. (2017), did not specify if the referrals were specific for assessment and management of the risk of malnutrition. In fact, these studies also reported the percentage of older persons who had normal nutritional status and were still referred to the dietitian (Table 2.8). Therefore, the actual referral rates of older persons at risk of malnutrition to the dietitian for malnutrition assessment and management in these studies might have been lower than quoted.

The referral rate in this study (50.4%), contrasted the finding by Adams et al. (2008) were only 9.0% of older persons at risk of malnutrition admitted into medical wards, were referred to the dietitian. In the latter study, although not specified, the referrals might

have all been to assess and manage malnutrition, as there was no referral for older persons with normal nutritional status.

Therefore, at KGRH the referral rate to the DND of older persons found at risk of malnutrition (50.4%) is better than many of the quoted studies, which percentages ranged from 9.0% to 56.0%. However, this does not imply that it is a good referral rate, since all persons found at risk of malnutrition should be referred to the DND for malnutrition assessment and management (ASPEN 2011; Kondrup et al., 2002; NICE 2006;). Indeed, it confirms that malnutrition is still unrecognised, undiagnosed and untreated (Bavelaar et al., 2008; Sauer et al., 2016; Watterson et al., 2009).

Another point to note is that the DND at KGRH had only been established for eight months prior to this study. Moreover, the referral of older persons found at risk of malnutrition was introduced four months prior to the start of this study. As it would take some time for a procedure to be established and become routine, having a referral rate of 50.4% after four months can augur that in the future this would continue to increase.

Nonetheless, it was noted that 3 older persons, although having a normal nutritional status as determined using the MNA-SF, were still referred to the DND for malnutrition assessment and management. As the nurses are the professionals who initiate the referral process, this observation hints that some nurses are not aware that a score between 12 to 14 on the MNA-SF, does not warrant a referral for malnutrition assessment and management.

5.3.4 Characteristics of Older Persons at Risk of Malnutrition and Referred to DND for Malnutrition Assessment and Management

This study also sought to establish if there was an association between characteristics of the older persons who were at risk of malnutrition (MNA-SF score 0-11) upon admission to KGRH, and referral to the DND for malnutrition assessment and management. The characteristics tested for association include the older persons' age, gender and the MNA-

SF score category (MNA-SF 0-7 versus 8-11). None of the retrieved studies which investigated malnutrition in older persons in a rehabilitation setting looked at these associations.

The findings from this study indicated that referrals to the DND, for malnutrition assessment and management, increased as the age of the older person found to be at risk of malnutrition, increased (37.5% for age category 65-75 years versus 57.1% for age category 81-85 years, Figure 4.8). However, this trend was not sustained for the oldest old (86-100 years) where the referral rate dropped to 50.0% (Figure 4.8). Furthermore, for the youngest-old age category (65-75 year), unlike for the rest, the majority of the persons found at risk of malnutrition (62.5%), were not referred to the DND for malnutrition assessment and management (Figure 4.8). Notwithstanding these observations statistical analysis showed that there was no association between the age categories of the older persons and referral to the DND (p= 0.501, Table 4.11).

A possible explanation for the above, which however, was not investigated in this study, could be attributed to frailty. Features of frailty can be easily seen, including exhaustion, weakness, slow walking speed, weight loss and low physical activity. Unlike features of risk of malnutrition which include recent weight loss, psychological distress and decreased food intake (Appendix F). As shown by Fried et al. (2001), the incidence of frailty increased with age. Moreover, Wei et al. (2017) through their study concluded that frailty increased with increased risk of malnutrition. Hence, nurses might be more compelled to refer older persons at risk of malnutrition who are in the older age categories (76-80 years, 81-85 years) and who look frail than older persons who are in the younger old age category (65-75 years) and do not look so frail. However, this does not explain why the trend in the referrals dropped for the oldest old (86-100 years), given that they would be the ones with increased features of frailty from all the age groups.

Furthermore, the findings of this study indicated that referrals of older persons at risk of malnutrition was not associated with gender. In fact, 51.2% of males and 50.0% of females found at risk of malnutrition, were referred to the DND (Figure 4.9). This

indicated that both male and female older persons, at risk of malnutrition, were equally referred to the DND for malnutrition assessment and management.

Furthermore, this local study established that out of the 61 older persons who were found at risk of malnutrition (MNA-SF 0-11) and referred to the DND, 56.8% had an MNA-SF score of 0-7 and 47.6% had an MNA-SF score of 8-11 (Figure 4.10). Thus, older persons who scored lower on the MNA-SF (0-7), meaning they had a higher risk of malnutrition than those who scored 8-11, were referred more to the DND for malnutrition assessment and management. Nonetheless, this association was not statistically significant (p= 0.354, Table 4.13). For persons to score between 0-7 on the MNA-SF, they had to be experiencing poor mobility, weight loss, decreased food intake and/or low BMI. As explained above, low mobility and weight loss are features of frailty. Thus, a plausible explanation for the higher referral to the DND of persons scoring 0-7 on the MNA-SF, might be linked to the nurses considering these persons as being more frail than those who scored 8-11 on the MNA-SF.

5.3.5   Linking Part 1 and Part 2 of this Study

Knowledge on malnutrition in older persons, is essential for nurses working at KGRH since they are the professionals who carry out the malnutrition screening process, initiate the referral to the DND and implement any nutrition care plan given by the dietitian. As explained in the literature review, the Donabedian Quality of Care Model proposes that, the structures will influence the process and this will affect the outcome (Donabedian, 2002) (Section 2.10). Following this model, the nurses' knowledge could be construed as the structure (Bauer et al. 2015). According to the findings from this study, nurses at KGRH lacked knowledge on malnutrition in older persons, as the mean score on this topic was 51.3%. As the Donabedian Quality of Care Model postulates, this limited knowledge might have been a potential cause for the low referral rate (50.4%) of older persons at risk of malnutrition to the DND. The referral being seen as the process, using the same model. Finally, following the Donabedian Quality of Care Model, the low referral rate of older persons at risk of malnutrition to the DND for malnutrition assessment and management,

could lead to worse health outcomes. Including worsening of nutritional status for the older persons whilst at KGRH.

5.4   STRENGTHS AND LIMITATIONS OF THIS STUDY

A number of limitations were present in this study. As with all quantitative studies, this study sought to generalise the findings to the target population. To aim for generalizable results and owing to the small target nursing population, all the nurses who fulfilled the inclusion criteria were invited to participate in this study (Section 3.71, 3.72). However, this limited the sample to a non-probabilistic one. Also, the characteristics of nurses who declined to participate in the studies were not known and nurses who participated might have had greater knowledge or interest on malnutrition. Nevertheless, these limitations were surpassed by achieving a high response rate of 72.9% (105 nurses) from the target population. Thus, the sample offers a good representation of the target population and the findings can be generalised to the target nurses' population at KGRH (L. Camilleri, personal communication, December, 2018).

Another limitation was that, as the KoM-G questionnaire was self-administered by the nurses, there might have been a reporting bias. Where nurses could have sought help to fill the questionnaires or even discussed answers between themselves. However, given the time constraints to finish this study, a self-administered questionnaire was deemed the best option to increase the response rate from the nurses.

Furthermore, while the researcher investigated the association between the nurses' knowledge and their highest level of academic qualification, not enquiring if they had specific training on malnutrition was a limitation.

The use of reliable and valid tools to measure the knowledge of nurses on malnutrition (KoM-G) and the risk of malnutrition of older persons (MNA-SF), was a strength in this study. Inter-rater reliability when measuring the MNA-SF score of the older persons, was maximised as nurses working at KGRH had been given in-house training by dietitians on

the use of the MNA-SF, four months prior the start of this study. The limitation of measuring the prevalence of risk of malnutrition in older persons upon admission to KGRH for a short time frame of two months, was counterbalanced by limiting the exclusion criteria for this cohort. Thus, the study provided a true representation of the prevalence of risk of malnutrition in older persons, upon admission to KGRH.

5.5 CONTRIBUTIONS OF THIS STUDY TO RESEARCH, THEORY AND PRACTICE

Despite the aforementioned limitations, this study will add to the broader knowledge of literature on the prevalence of risk of malnutrition in older persons, upon their admission to a Maltese rehabilitation hospital. Furthermore, in the international fora, there is a scarce number of studies which specifically investigated the knowledge of nurses on malnutrition in older persons. More so when nurses working in a rehabilitation hospital were the target population. Hence, this study provides a valuable baseline data against which future studies, on this aspect of gerontology can be compared.

This study, although not tested directly, served to further support the Donabedian Quality of Care Model. As explained in Section 5.3.5, the limited knowledge of nurses on malnutrition in older persons (structure), might have been a contributing factor in having half of older persons at risk of malnutrition not referred to the DND for malnutrition assessment and management (process).

The findings from this study can ultimately serve as a guide and driving force for the management of KGRH to ameliorate the knowledge of the nurses on malnutrition in older persons. As well as to strive to increase the number of older persons at risk of malnutrition being referred to the DND for malnutrition assessment and management. Hence, older persons at risk of malnutrition admitted at KGRH would not only stand to improve their physical function but also their nutritional status.

5.6   CONCLUSION

This chapter discussed the findings of this study in relation to its aims. It also compared the findings to other international studies. The strengths and limitations of this study were highlighted. This chapter ended with the contributions that this study can have to research, theory and current practice.

The following chapter will conclude this dissertation. The issue of malnutrition in older persons will be refocused, based on the findings from this study. It will also present recommendations for practice, policy and research on malnutrition in older persons.

CHAPTER 6
CONCLUSION

6.1 CONCLUDING REMARKS

Older persons are an ever growing portion of the population (United Nations, 2017). Longevity, is mostly attributed to the advances in medical care (WHO, 2018a). However, many older persons suffer debilitating conditions, which require a period of rehabilitation to enable them to recuperate or ameliorate their physical function (Vos et al., 2016).

Compared to other age groups, older persons are more susceptible to being malnourished (Stanga, 2009). As such, authoritative bodies in the field of nutrition such as the ASPEN (2011) and ESPEN (2003) recommended that, all older persons should be screened for risk of malnutrition when they first come in contact with health care services. This screening should then be repeated regularly.

When an older person is admitted to a hospital, malnutrition risk screening should be carried out upon admission (ASPEN, 2011). If an older person is identified as being at risk of malnutrition, a dietitian should be involved for the appropriate assessment and management. An individually designed nutrition care plan is devised by a dietitian to improve the nutritional status of the malnourished older person. The care plan would then be incorporated into the daily nursing care for the older person.

Rehabilitation has been cited as the setting, across the healthcare continuum, with the greatest prevalence of older persons at risk of malnutrition (Beck et al. 2001; Kaiser et al. 2010; Kaiser et al. 2011). The study conducted for this dissertation, which employed a quantitative methodology, further supports these findings. In fact, in this study, over a two-month period, 80.7% of older persons, aged 65 years or over, were found to be at risk of malnutrition, upon their admission to KGRH. From this study, there does not seem to be any association between the age ($p = 0.361$) (Table 4.9) or the gender ($p = 0.243$) (Table 4.10) of the older persons and their nutritional status.

Furthermore, it has been reported that persons at risk of malnutrition are poorly diagnosed and treated (Bavelaar, et al., 2008; Sauer et al., 2016; Watterson et al., 2009). This study

showed that Malta is no exception, as 50.4% of the older persons screened as being at risk of malnutrition, upon their admission to KGRH, were referred to the DND, for malnutrition assessment and management. In rehabilitation this could lead to (a) poor engagement during any form of therapeutic intervention with a resulting poor functional outcome (Neumann et al., 2005; Slattery et al., 2015; Wakabayashi & Sashika, 2014), (b) poorer quality of life (Neumann et al., 2005) and (c) the older person requiring relocation to a residential care setting (Charlton et al., 2012). Moreover, the older persons' age (p= 0.501) (Table 4.11), gender (p= 0.903) (Table 4.12) or MNA-SF score category (p= 0.354) (Table 4.13), did not bear any significance on whether the older person was referred to the DND for malnutrition assessment and management.

Nurses' knowledge on malnutrition was identified as a leading factor in improving the nutritional status of malnourished persons (Duerksen et al. 2016; Mowe et al., 2008). This study, through a self-administered KoM-G questionnaire, established that nurses working at KGRH, had a mean knowledge score on malnutrition in older persons of 51.3%. Most nurses were knowledgeable on signs and consequences of malnutrition (Table 4.2). However, the majority of nurses were not knowledgeable on the risk factors for malnutrition, the nutrients required by older persons, the professionals to involve so as to improve the nutritional status of the older persons and how to prevent and ameliorate malnutrition (Table 4.2). The nurses' age (p= 0.754) (Table 4.4), gender (p= 0.749) (Table 4.5), years of nursing experience (p= 0.605) (Table 4. 6) or highest level of academic qualifications (p= 0.078) (Table 4.7) were not associated with their level of knowledge on malnutrition in older persons.

6.2   RECOMMENDATIONS
The aforementioned findings are calling for the following recommendations.

6.2.1 Recommendations for Education of Health Care Professionals
1. Education on malnutrition, should be given its due importance in courses leading to qualifications in the nursing profession.

2. Qualified nurses and carers should be offered in-service training in the field of malnutrition in the older persons. This should include the (a) risk factors for malnutrition, (b) consequences of malnutrition, (c) preventative measures, (d) corrective measures, (e) debunking myths on older persons' malnutrition (f) overcoming barriers to appropriate nutrition care, (g) what an appropriate diet for older persons should consist of and (h) delivery of appropriate nutrition. To facilitate transition from theory to practice, training should be both theory based as well as hands on practice.

6.2.2 Recommendations for Education of Older Persons and Relatives

1. Older persons should be provided with information on malnutrition. This should include the (a) risk factors, (b) how to recognise the warning signs leading to malnutrition, (c) treatment for malnutrition and (d) where/ how to seek nutritional help. Information can be provided through (a) leaflets sent to older persons and available at general practitioners, pharmacies, local councils and older persons' organisations (b) television/radio slots and (c) talks to groups of older persons.
2. Steering group to organise older persons' malnutrition screening and advice activities during malnutrition awareness week.

6.2.3 Recommendations for a Change in Practice

1. Malnutrition screening tools should include the (a) signature of the nurse conducting the screening and (b) actions taken by the nurse.
2. At hospitals, malnutrition screening should be available online, with an automatic referral system to the DND should the score identify a person as at risk of malnutrition.
3. Automatic e-mail alert to the DND, of any older persons admitted to KGRH who had a history of being at risk of malnutrition or malnourished during previous admissions.
4. Malnutrition screening and appropriate referral should be an integral part of any holistic medical assessment involving older persons.
5. All older persons admitted in a care setting should be screened upon admission for malnutrition and any necessary action taken.

6. All older persons, living/relocated to a care setting, should be offered meals/snacks appropriate to their requirement. When necessary, they should be offered the appropriate utensils and assistance.

7. The hospital should promote nutrition through adaptation of the environment, including the (a) utensils, (b) plating of the food, (c) designated dining area on each ward.

8. Food is to be provided in a red tray to older persons who would require assistance to eat or who need extra time to finish their meal. This would prompt the nurses and carers to provide for such requirements, aiding to increase the nutrient intake of these older persons.

9. The presence of link nurses on nutrition in each ward at KGRH, to oversee that (a) all older persons are screened upon admission, (b) the ones at risk are referred to the DND and (c) their nutrition care plan is implemented.

10. A nutrition committee should be set up at KGRH. This should include members of the multidisciplinary team. Their aim would be to improve detection, timely intervention, audit, devise nutrition policies and improve the nutrition of persons admitted at KGRH.

11. Introducing a steering committee to identify and address issues which are hindering from achieving a 100% referral rate to the DND, of older persons identified as at risk of malnutrition at KGRH.

12. Protected meal times should be established across the health care settings. Through this, any non-essential interruptions during meals will be avoided. This should also be extended to visitors, who would only be allowed in the care setting to help the older person to eat.

6.2.4 Recommendations for Policy Change

1. Streamlining the number of hours dedicated to malnutrition education, across all courses leading to a nursing qualification.

2. Competency standards for nurses should include malnutrition screening and malnutrition care pathways.

3. Implementation of the recommended ratio of dietitians to older persons across the health care settings. This would ensure timely interventions and appropriate follow-up care.

4. The role of the nurses in malnutrition prevention, identification and treatment should be clearly stated in the nursing duties.

5. Standard operating procedures should be in place on (a) screening to identify older persons at risk of malnutrition, (b) diagnosing malnutrition and (c) managing the older person identified as at risk of malnutrition or malnourished.

6. Improvement of the older persons' nutrition status to be regarded as one of the hospitals' quality care performance indicators.

6.2.5 Recommendations for Future Research

1. Local research on knowledge on malnutrition of the multidisciplinary team members working with older persons. This would identify any malnutrition knowledge needs and guide towards appropriate training.

2. Research on malnutrition knowledge of nurses working in the community, acute settings and residential care. This to identify common knowledge needs to design appropriate malnutrition courses.

3. A root cause analysis to identify the causes of malnutrition in older persons.

4. Research to establish if factors including, continuous professional development courses or the number of hours of formal undergraduate training on malnutrition, have an effect on the nurses' knowledge on malnutrition in older persons.

5. Routine audit on malnutrition screening and management.

6. Re-do the present study after the nurses at KGRH would have been given the required training on malnutrition. This to check if malnutrition education would have improved the nurses' knowledge and whether education leads to better identification of older persons at risk of malnutrition.

7. Cost-Benefit analysis of identifying and treating older persons at risk of malnutrition.

8. Research on the barriers associated with referring the older persons identified as at risk of malnutrition to the DND.

9. Study to track the nutritional pathway of older persons across their hospital stay.

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APPENDICES

APPENDIX A

Knowledge of Malnutrition – Geriatric Questionnaire (KoM-G) Maltese Version

L-Għarfien tal-Malnutrizzjoni – Ġerjatriku (KoM-Ġ) Kwestjonarju

Għal kull domanda, jekk jogħġbok immarka t-tweġiba/iet li fl-opinjoni tiegħek hi/huma t-tajba/in. Jistà jagħti l-kas li t-tajba tkun waħda, xi wħud jew kollha. F'kas li ma tkunx taf ir-risposta t-tajba, immarka 'Ma nafx'.

1. X'inhuma l-fatturi ta' riskju possibli li jwasslu għall-malnutrizzjoni?
   - ○ Dipendenza għall-kura
   - ○ Dipressjoni
   - ○ Incontinenza
   - ○ Kanċer
   - ○ It-teħid ta' diversi mediċini (aktar minn 5 kuljum)
   - ○ Ma nafx

2. X'jistgħu jkunu l-konsegwenzi tal-malnuttrizzjoni?
   - ○ Żieda fir-ritmu tal-qalb
   - ○ Issir aktar suxxettibli għall-infezzjonijiet
   - ○ Nuqqas ta' saħħa fil-muskoli
   - ○ Il-ġrieħi jfiqu aktar bilmogħod
   - ○ Ma nafx

3. X'jistgħu jkun is-sinjali possibli tal-malnuttrizzjoni?
   - ○ Telf ta' piż bla intenzjoni
   - ○ Tnaqqis fil-konsum tal-ikel
   - ○ Ħwejjeġ wesgħin
   - ○ Nuqqas ta' mobiltà
   - ○ Żieda fil-pressjoni tad-demm
   - ○ Ma nafx

4. X'jistgħu jkun is-sinjli possibli tad-deidrazzjoni?
   - ○ Nuqqas ta' *skin turgor*
   - ○ Dipressjoni
   - ○ Awrina ikkonċentrata
   - ○ Pressjoni tad-demm għolja
   - ○ Konfużjoni akuta u bla spjegazzjoni
   - ○ Ma nafx

5. Liema indikaturi għandhom jiġu eżaminati fl-iscreening nutrizzjonali?
   ○ Il-piż f'perjodi differenti
   ○ Is-severità tal-marda
   ○ Albumina
   ○ Il-konsum tal-ikel
   ○ Indiċi tal-massa tal-bniedem (*BMI*)
   ○ Ma nafx

6. Meta għandhom ir-residenti jiġu eżaminati għall-malnutrizzjoni?
   ○ Qatt
   ○ Meta jidħlu l-isptar
   ○ Meta jkun hekk bidla f'daqqa fil-kundizzjoni
   ○ Kull tliet xhur
   ○ F'nofs is-sena
   ○ Ma nafx

7. X'inhu l-piż normali u san tal-*BMI* (indiċi tal-massa tal-bniedem) għar-residenti minn 65 sena 'l fuq?
   ○ 17-22kg/m^2
   ○ 19-24 kg/m^2
   ○ 22-27 kg/m^2
   ○ 24-29 kg/m^2
   ○ 27-32 kg/^{m2}
   ○ Ma nafx

8. Liema persentaġġ ta' tnaqqis f'piż mingħajr intenzjoni fl-aħħar tliet xhur huwa'sinjal ta' malnutrizzjoni?
   ○ Minn 2%
   ○ Minn 5-10%
   ○ Minn 10-15%
   ○ Minn 20%
   ○ Minn 35-40%
   ○ Ma nafx

9. Liema professjonijiet għandhom jiġu involuti meta jkun neċessarju sabiex jiġu ikkurati r-residenti malnutriti?
   ○ Terapisti okkupazzjonali
   ○ *Carers*
   ○ Esperti tad-dieta
   ○ Tobba
   ○ Patoloġi tad-diskors u tal-lingwa
   ○ Ma nafx

10. Resident għadu kemm naqas tliet kilos bla intenzjoni fl-aħħar xhar. X'passi kieku tieħu?
   ○ Tinfurma l-pazjent u lil-parent tiegħu bl-importanta ta' nutrizzjoni suffiċjenti
   ○ Tinvolvi espert tad-dieta
   ○ Tiprova tiskopri l-kawża ta' dan it-tnaqqis fil-piż
   ○ T'assessja bl-akbar reqqa l-konsum tal-ikel
   ○ Tinforma ruħek dwar il-preferenzi tal-pazjent rigward l-ikel
   ○ Ma nafx

11. B'liema mod l-enerġija u n-nutrienti meħtieġa ta' kuljum jinbidlu għar-residenti minn 65 sena 'il fuq?
   ○ Il-kaloriji u n-nutrienti meħtieġa ta' kuljum jiżdiedu
   ○ Il-kaloriji u n-nutrienti meħtieġa ta' kuljum jitnaqsu
   ○ Il-kaloriji meħtieġa ta' kuljum jitnaqsu u n-nutrienti jibqgħu l-istess
   ○ Il-kaloriji meħtieġa ta' kuljum jiżdiedu u n-nutrienti jibqgħu l-istess
   ○ Il-kaloriji u n-nutrienti meħtieġa ta' kuljum jibqgħu l-istess anke meta tikber
   ○ Ma nafx

12. L-ammont ta' fluwidu meħtieġ ta' kuljum...?
   ○ ...jammonta għal 13000ml
   ○ ...f'ċirkostanzi normali huwa 30-35ml/kg piż tal-ġisem
   ○ ...f'ċirkosanzi normali l-medja tammonta għal-litru
   ○ ...tinbidel skont is-sħana u ċertu mard
   ○ ...f'ċirkostanzi normali huwa 40-45ml/kg piż tal-ġisem
   ○ Ma nafx

13. X'fatturi jwasslu sabiex tiżdied il-ħtieġa ta' aktar enerġija u proteini?
    ○ Problemi int u tibla
    ○ Ġrieħi miftuħa
    ○ Deni
    ○ Tensjoni inkontinenti
    ○ Nuqqas ta' mistrieħ u moviment kontinwu
    ○ Ma nafx

14. X'nutrienti speċifiċi huma meħtieġa għar-residenti li jbagħtu bil-pressjoni tal-ulċera?
    ○ Aktar bżonn ta' proteina
    ○ Aktar bżonn ta' potassju
    ○ Aktar bżonn ta' sodju
    ○ Aktar bżonn ta' fibra
    ○ Aktar bżonn ta' xaħam mhux saturat
    ○ Ma nafx

15. Għaliex l-infermieri għandhom iżommu tabella tal-ikel u tal-likwidi?
    ○ Biex tiskopri meta l-persuna kielet u xorbot
    ○ Biex tiskopri kemm il-persuna kielet u xorbot
    ○ Biex tiskopri x'kielet u x'xorbot il-persuna
    ○ Biex tiġi dijanjostikata d-dimenzja
    ○ Biex teskludi l-possibiltà ta' depressjoni
    ○ Ma nafx

16. X'fatturi jistgħu jaffettwaw pożitivament it-teħid ta' nutrienti oralment?
    ○ Billi jiġi provdut l-ikel li jgħoġob lir-resident
    ○ Uġiħ
    ○ Tiekol fil-preżenza ta' ħaddieħor
    ○ Tevita distrazzjonijiet, eżempju t-tqassim ta' mediċini waqt l-ikliet
    ○ Apoġġ xierqa rigward il-konsum tal-ikel
    ○ Ma nafx

17. X'fatturi jistgħu jaffettwaw negattivament it-teħid ta' nutrienti oralment?
    ○ Jiġi provdut ikel mhux familjari
    ○ Interruzzjoni waqt l-ikel
    ○ Dentaturi mhux impoġġiha sew
    ○ Uġiħ
    ○ Iżolazzjoni soċjali
    ○ Ma nafx

18. X'approċċ għandu idealment jittieħed għar-resident b'disfaġja ħafifa li jkun f'riskju ta' malnutrizzjoni?

○ Sapport xieraq waqt l-għotija tal-ikel

○ L-għotija ta' suplimenti nutrizzjonali oralment

○ L-għotija ta' nutrienti permezzz tad-drip

○ L-għotija ta' ikel mimli b'enerġija u bi proteini

○ L-għotija ta' ikel mgħaffeġ

○ Ma nafx

19. Għal liema residenti l-għotija tal-ikel permezz ta' tubu ta' l-ikel hu adatt?

○ Resident b'diffikultajiet kbar biex jibla'

○ Resident b'marda terminali u li jkun wasal fl-aħħar stat

○ Residenti b'sistema diġestiva taħdem tajjeb

○ Residenti b'nuqqas t'aptit

○ Resident li l-ħtiġijiet tiegħu tal-enerġija u tan-nutrienti ma jistgħux jintlaħqu oralment f'diversi ġranet

○ Ma nafx

APPENDIX B

Knowledge of Malnutrition – Geriatric Questionnaire (KoM-G) English Version

Knowledge of Malnutrition – Geriatric (KoM-G) Questionnaire

For each question, please tick the answer/s which in your opinion is/are the right one/s. There might be one, several or all answers could be right. In case you do not know the right answer, please tick 'I don't know'.

1. What are the possible risk factors for malnutrition?
   - ○ Dependency for care
   - ○ Depression
   - ○ Incontinence
   - ○ Cancer
   - ○ Intake of multiple medications (more than 5 a day)
   - ○ I don't know

2. What are the possible consequences of malnutrition?
   - ○ Increased heart activity
   - ○ Increased susceptibility to infections
   - ○ Reduced muscle strength
   - ○ Reduced wound healing
   - ○ Reduced quality of life
   - ○ I don't know

3. What are the possible signs of malnutrition?
   - ○ Unintentional weight loss
   - ○ Reduced food intake
   - ○ Loose fitting clothing
   - ○ Impaired mobility
   - ○ Increased blood pressure
   - ○ I don't know

4. What are the possible signs of dehydration?
   - ○ Decreased skin turgor
   - ○ Depression
   - ○ Concentrated urine
   - ○ High blood pressure
   - ○ Acute, unexplained confusion
   - ○ I don't know

5. Which indicators should be assessed in nutritional screening?
   ○ Weight history
   ○ Severity of illness
   ○ Albumin
   ○ Food intake
   ○ Body Mass Index (BMI)
   ○ I don't know

6. When should the residents be screened for malnutrition?
   ○ Not at all / never
   ○ When admitted in hospital
   ○ When there is a sudden change in condition
   ○ Every 3 months
   ○ Half yearly
   ○ I don't know

7. What is the normal and healthy BMI (Body Mass Index) of residents 65 years or older?
   ○ 17-22 kg/m^2
   ○ 19-24 kg/m^2
   ○ 22-27 kg/m^2
   ○ 24-29 kg/m^2
   ○ 27-32 kg/^{m2}
   ○ I don't know

8. What percentage of unintentional body weight loss in the past 3 months is a possible sign of malnutrition?
   ○ From 2%
   ○ From 5-10%
   ○ From 10-15%
   ○ From 20%
   ○ From 35-40%
   ○ I don't know

9. Which professions should be involved when necessary in treating malnourished residents?
   - ○ Occupational therapists
   - ○ Carers
   - ○ Dietitians
   - ○ Physicians
   - ○ Speech and Language Pathologists
   - ○ I don't know

10. A resident has unintentionally lost 3kg in the last month. What are the steps you would take?
    - ○ Inform the patient and relative about the importance of sufficient nutrition
    - ○ Involve a dietitian
    - ○ Try to find out the reason for the loss of weight
    - ○ Thoroughly assess the food intake
    - ○ Enquire about the food preferences of the resident
    - ○ I don't know

11. In which way does the daily energy and nutrient requirements change for residents 65 years or older?
    - ○ The daily requirements for calories and nutrients increase
    - ○ The daily requirements for calories and nutrients decline
    - ○ The daily requirements for calories decline and nutrients remain the same
    - ○ The daily requirements for calories increase and for nutrients remain the same
    - ○ The daily requirements for calories and nutrients do not change when you get older
    - ○ I don't know

12. The daily fluid requirement of a person…?
    - ○ …amounts to 1300ml
    - ○ …under normal circumstances is 30-35ml/kg body weight
    - ○ …under normal circumstances on average is 1 litre
    - ○ …changes according to heat or certain diseases
    - ○ …under normal circumstances is 40-45ml/kg body weight
    - ○ I don't know

13. What factors can lead to higher energy and protein requirements?
    - ○ Swallowing disorders
    - ○ Open wounds
    - ○ Fever
    - ○ Stress incontinence
    - ○ Restlessness and constantly moving
    - ○ I don't know

14. What specific nutrient requirements do residents with pressure ulcers have?
    - ○ Increased need of protein
    - ○ Increased need of potassium
    - ○ Increased need of sodium
    - ○ Increased need of fibre
    - ○ Increased need of unsaturated fatty acid
    - ○ I don't know

15. Why should nurses keep a food and fluid chart?
    - ○ To find out when the person eats and drinks
    - ○ To find out how much the person eats and drinks
    - ○ To find what the person eats and drinks
    - ○ To diagnose potential dementia
    - ○ To exclude potential depression
    - ○ I don't know

16. What factors can positively affect oral nutritional intake?
    - ○ Providing the food the resident desires
    - ○ Pain
    - ○ Eating in the presence of others
    - ○ Avoiding interruptions, example distribution of medication during meals
    - ○ Appropriate feeding support
    - ○ I don't know

17. What factors can negatively affect oral nutritional intake?
    - ○ Offering unfamiliar food
    - ○ Interruption during meals
    - ○ Poorly fitting dentures
    - ○ Pain
    - ○ Social isolation
    - ○ I don't know

18. What interventions should be ideally done for a resident with mild dysphagia at risk of malnutrition?
    - ○ Appropriate support during feeding
    - ○ Giving sip feeds
    - ○ Giving nutrients via infusion
    - ○ Giving energy and protein enriched food
    - ○ Giving mashed food
    - ○ I don't know

19. For which residents is tube feeding appropriate?
    - ○ Resident with very strong difficulties with swallowing
    - ○ Resident with end stage terminal disease
    - ○ Residents with a functional gut
    - ○ Residents with lack of appetite
    - ○ Resident whose energy and nutrition needs cannot be met over several days via oral intake
    - ○ I don't know

APPENDIX C

Demographic Questionnaire Maltese Version

Folja ta' Informazzjoni Demografika

Età: _____

Sess (immarka t-tajba):   Raġel ☐   Mara ☐   Ieħor ☐

Snin ta'esperjenza ta' nfermier/a: _____

L-ogħla kwalifika akkademika ta' nfermier/a (mmarka t-tajba):   Ċertifikat ☐

Diploma ☐

Degree ☐

Master ☐

Dottorat ☐

APPENDIX D

Demographic Questionnaire English Version

Demographic Information Sheet

Age: _____

Gender (tick the right one):   Male ☐   Female ☐ Other ☐

Years of nursing experience: _____

Highest nursing academic qualification (tick the right one):   Certificate ☐

 Diploma ☐

 Degree ☐

 Master ☐

 Doctorate ☐

APPENDIX E

Data Collection Form

Data Collection Form

Participant Number	MNA-SF score	Gender (M/F/O)	Age (yrs)	Referred to DND (Y/N)
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				

APPENDIX F

Mini Nutritional Assessment – Short Form (MNA-SF)

MNA®

Nestlé NutritionInstitute

Last name:		First name:	

Sex:	Age:	Weight, kg:	Height, cm:	Date:

Complete the screen by filling in the boxes with the appropriate numbers. Total the numbers for the final screening score.

Screening

A Has food intake declined over the past 3 months due to loss of appetite, digestive problems, chewing or swallowing difficulties?
0 = severe decrease in food intake
1 = moderate decrease in food intake
2 = no decrease in food intake ☐

B Weight loss during the last 3 months
0 = weight loss greater than 3 kg (6.6 lbs)
1 = does not know
2 = weight loss between 1 and 3 kg (2.2 and 6.6 lbs)
3 = no weight loss ☐

C Mobility
0 = bed or chair bound
1 = able to get out of bed / chair but does not go out
2 = goes out ☐

D Has suffered psychological stress or acute disease in the past 3 months?
0 = yes   2 = no ☐

E Neuropsychological problems
0 = severe dementia or depression
1 = mild dementia
2 = no psychological problems ☐

F1 Body Mass Index (BMI) (weight in kg) / (height in m)^2 ☐
0 = BMI less than 19
1 = BMI 19 to less than 21
2 = BMI 21 to less than 23
3 = BMI 23 or greater ☐

IF BMI IS NOT AVAILABLE, REPLACE QUESTION F1 WITH QUESTION F2.
DO NOT ANSWER QUESTION F2 IF QUESTION F1 IS ALREADY COMPLETED.

F2 Calf circumference (CC) in cm
0 = CC less than 31
3 = CC 31 or greater ☐

Screening score
(max. 14 points) ☐☐

12-14 points:	☐	Normal nutritional status
8-11 points:	☐	At risk of malnutrition
0-7 points:	☐	Malnourished

Save
Print
Reset

Ref.   Vellas B, Villars H, Abellan G, et al. *Overview of the MNA® - Its History and Challenges.* J Nutr Health Aging 2006;10:456-465.
Rubenstein LZ, Harker JO, Salva A, Guigoz Y, Vellas B. *Screening for Undernutrition in Geriatric Practice: Developing the Short-Form Mini Nutritional Assessment (MNA-SF).* J. Geront 2001;56A: M366-377.
Guigoz Y. *The Mini-Nutritional Assessment (MNA®) Review of the Literature - What does it tell us?* J Nutr Health Aging 2006; 10:466-487.
Kaiser MJ, Bauer JM, Ramsch C, et al. *Validation of the Mini Nutritional Assessment Short-Form (MNA®-SF): A practical tool for identification of nutritional status.* J Nutr Health Aging 2009; 13:782-788.

APPENDIX G

Acceptance to act as Gatekeeper

L-Università
ta' Malta

Maria Schembri <maria.b.schembri.99@um.edu.mt>

invitation to act as gatekeeper

3 messages

Maria Schembri <maria.b.schembri.99@um.edu.mt>
To: brigitte.vassallo@gov.mt
Cc: Maria Aurora Fenech <maria-aurora.fenech@um.edu.mt>

1 June 2018 at 20:34

Dear Ms Vassallo,

I am Maria Schembri, currently a University of Malta student, reading for a Master of Gerontology and Geriatrics, with the Faculty for Social Wellbeing. As part fulfillment for this course, I would like to conduct a study entitled Nurses' knowledge and prevalence of malnutrition risk in older persons within a Maltese rehabilitation hospital. This study is being supervised by Dr Maria Aurora Fenech.

Through this e-mail I would like to ask you if you would kindly accept to act as a gatekeeper in the aforementioned study. Your role will be to:

1. inform nurses working on the wards at Rehabilitation Hospital Karin Grech (RHKG), that a study will be conducted to establish the knowledge of nurses on malnutrition in the geriatric population and if anyone is interested, they are to contact the researcher.

2. inform persons aged 65 years and over, admitted at RHKG, or if the admitted person is not able to make his own informed consent, the person's guardian or relative, will be informed, that a study will be conducted to establish the prevalence of malnutrition risk at RHKG and that the person is being invited to allow access, retrieval and recording of information from his medical file and if found to be at risk of malnutrition and was not referred for management to the Department of Nutrition and Dietetics, he would be referred accordingly.

3. for both nurses and persons admitted at RHKG or their guardian or relative, you are also to distribute an information sheet, which will contain information about the study and how to contact the researcher.

Whilst thanking you for your time, should you require any further information, do not hesitate to contact me.

Yours sincerely,

Maria Schembri
Master of Gerontology and Geriatrics Student

Virus-free. www.avast.com

Vassallo Brigitte at Rehabilitation Services-Health <brigitte.vassallo@gov.mt>
To: Maria Schembri <maria.b.schembri.99@um.edu.mt>
Cc: Maria Aurora Fenech <maria-aurora.fenech@um.edu.mt>

3 June 2018 at 09:03

Ms Schembri,

I will be accepting to act as gatekeeper both for the nurses and patients and a leaflet will be prepared and distributed for this study.

Regards

Brigitte Vassallo

Brigitte Vassallo
Chief Nursing Manager
Health-Rehabilitation Services
Rehabilitation Hospital

MINISTRY FOR HEALTH
ST LUKE'S HOSPITAL, PJAZZA SAN LUQA,
PIETA', MALTA

t +356 22080000 e brigitte.vassallo@gov.mt | https://health.gov.mt
Kindly consider your environmental responsibility before printing this e-mail

From: Maria Schembri [mailto:maria.b.schembri.99@um.edu.mt]
Sent: Friday, 01 June 2018 20:34
To: Vassallo Brigitte at Rehabilitation Services-Health
Cc: Maria Aurora Fenech
Subject: invitation to act as gatekeeper

[Quoted text hidden]

image001.jpg
24K

Maria Schembri <maria.b.schembri.99@um.edu.mt>   3 June 2018 at 11:59
To: Vassallo Brigitte at Rehabilitation Services-Health <brigitte.vassallo@gov.mt>
Cc: Maria Aurora Fenech <maria-aurora.fenech@um.edu.mt>

Dear Ms Vassallo,

Thank you for accepting to act as a gatekeeper. There is no need to prepare a leaflet. All the information sheets for the participants will be given to you.

Kind regards,
Maria Schembri
Master of Gerontology and Geriatric student
[Quoted text hidden]

APPENDIX H

Information Sheet for Nurses Maltese Version

Folja ta' Informazzjoni għall-Infermiera Parteċipanti

Għażiż/a Sinjur/a,

Jiena Maria Schembri, attwalment studenta ta' l-Università ta' Malta, naħdem għaċ-ċertifikat tal-Master fil-Ġerontoloġija u fil-Ġerjatrija mal-Fakulta tal-Benesseri Soċjali. Bħala parti mill-esekuzzjoni għal dan il-kors, qed inwettaq studju intitolat *L-għarfien tal-infermiera u l-prevalenza tar-riskju ta' malnutrizzjoni f'persuni anzjani fi sptar ta' riabilitazzjoni Malti.* Dan l-istudju qed jiġi sorveljat minn Dr Maria Aurora Fenech, mid-Dipartiment tal-Ġerontoloġija.

L-istudju huwa maqsum f'żewġ partijiet, waħda sabiex tistablixxi l-prevalenza tar-riskju ta' malnutrizzjoni f'persuni li għandhom 65 sena u aktar, ammessi fl-Isptar tar-Riabilitazzjoni Karin Grech (SRKG) u jiddetermina jekk persuni anzjani identifikati li qiegħdin f'riskju ta' malnutrizzjoni ġewx riferuti lid-Dipartiment tan-Nutrizzjoni u Dietetika għall-immaniġġjar tan-nutrizzjoni. Dan se jinkiseb billi jiġu aċċessati, irkuprati u rreġistrati, mill-fajls mediċi tal-persuni anzjani, il-punteġġ tal-Mini Nutritional Assessment – Short Form, l-età, sess u jekk il-persuna ġietx riferuta lid-Dipartiment tan-Nutrizzjoni u Dietetika għall-immaniġġjar tan-nutrizzjoni.

Il-parti l-oħra tal-istudju ser tevalwa l-għarfien tal-infermiera li jaħdmu fl-SRKG, dwar il-malnutrizzjoni fil-popolazzjoni ġerjatrika. Dan l-għan ser jintlaħaq billi l-infermiera li jaħdmu fis-swali fl-SRKG jintalbu jimlew kwestjonarju dwar il-malnutrizzjoni, flimkien ma' folja ta' informazzjoni demografika dwar il-karatteristiċi tal-parteċipanti, eż. età u sess.

L-approvazzjoni etika biex jitwettaq dan l-istudju ngħatat mill-Kumitat tal-Etika għar-Riċerka tal-Fakultà fl-Università ta' Malta, mill-bord tal-Etika fl-SRKG kif ukoll mill-uffiċjal tal-protezzjoni tad-data fl-SRKG. Il-permess għar-reklutaġġ ta' l-infermiera mis-swali fl-SRKG ingħata wkoll mingħand il-Kap ta' l-infermerija fl-SRKG.

Permezz ta' din il-folja ta' informazzjoni, nixtieq nistiednek sabiex tipparteċipa f'dan l-istudju billi tiffirma l-formoli tal-kunsens, u timla personalment il-kwestjonarju L-Għarfien tal-Malnutrizzjoni – Ġerjatriku (KoM-Ġ) u l-folja ta' informazzjoni demografika. Dawn jieħdu madwar 10 minuti sabiex jimtlew filwaqt li informazzjoni essenzjali biss ser tintalab. Bħala parteċipant/a, mhux ser tkun mitlub/a tidentifika lilek innifsek fil-kwestjonarju u l-folja ta' informazzjoni demografika. Għalhekk, kemm l-anonimità kif ukoll il-kunfidenzjalità se jkunu salvagwardjati, kemm matul il-process ta' ġbir tad-data kif ukoll f'xi pubblikazzjoni li toħroġ minn dan l-istudju. Mhux previst

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l-ebda tip ta' riskju jew skumditajiet kemm fiżiċi kif ukoll psikoloġiċi għall-parteċipanti prospettivi.

Il-partecipitazzjoni tiegħek f'dan l-istudju ser tkun apprezzata ferm għax ser tgħin biex iżid l-għarfien dwar dan is-suġġett importanti. Madanakollu, id-deċiżjoni jekk tieħux s'hemm jew le f'dan l-istudju tibqa' f'idejk. Jekk tirrifjuta li tipparteċipa, ma tiġi imposta l-ebda penali. Madanakollu, tista' tirtira fi kwalunkwe ħin matul l-istudju mingħajr edba preġudizzju.

Jekk taċċetta li tipparteċipa f'dan l-istudju, jekk jogħġbok ikkuntattja lili fuq l-email jew in-numru tal-mobajl hawn taħt indikat. Meta jiġi stabbilit kuntatt inti tkun mitlub tiffirma żewġ karti tal-kunsens infurmativ, waħda li għanda tinżamm minnek u waħda għar-riċerkatriċi. Imbagħad tkun tista' timla l-kwestjonarju KoM-Ġ u l-folja ta'informazzjoni demografika. Dawn tista' timlijhom fil-konvenjenza tiegħek u tiddepożitahom flimkien ma' kopja waħda tal-formola tal-kunsens fil-kaxxa tal-istħarriġ ipprovduta fil-sala. Il-kaxxa tinġabar mir-riċerkatrċi fit-31 ta' Awwissu, 2018.

Id-data miġbura se tiġi kodifikata u maħżuna separatament mill-formoli tal-kunsens. Il-kwestjonarji kollha jinżammu f'post sikur, li l-aċċess għalih ikun limitat għar-riċerkatċi. Jekk ikun meħtieġ biss u għal skopijiet ta' verifika, din l-informazzjoni tkun aċċessibbli għas-superviżur, l-eżaminatur u r-reviżuri. Id-data kollha se tiġi pproċessata b'mod ġust u legali u la darba l-istudju jitlesta il-kwestjonarji kollha ser jinqerdu.

Nixtieq finalment niftakar li skond l-Att dwar il-Protezzjoni tad-Data, inti tista' taċċessa, timmodifika u tħassar id-data dwarek. F'dan ir-rigward u jekk għandek bżonn ta' aktar informazzjoni jew għandek xi mistoqsijiet dwar l-istudju, toqgħodx lura milli tikkuntattjani fuq id-dettalji ta' kuntatt hawn taħt indikati. Filwaqt li l-parteċipazzjoni tiegħek f'dan l-istudju se tkun apprezzata ħafna, nirringrazzjak tal-ħin li ħadt biex taqra din il-folja ta' informazzjoni.

Dejjem tiegħek,

Maria Schembri

Riċerkatriċi: Maria Schembri
e-mail: maria.b.schembri.99@um.edu.mt
Mobajl: 79620044

Superviżur: Dr Maria Aurora Fenech
e-mail:maria-aurora.fenech@um.edu.mt
Telefon: 23403187

APPENDIX I

Information Sheet for Nurses English Version

Information sheet for Nursing Participants

Dear Sir/Madam,

I am Maria Schembri, currently a University of Malta student, reading for a Master of Gerontology and Geriatrics with the Faculty for Social Wellbeing. As part fulfilment for this course, I am conducting a research study entitled *Nurses' knowledge and prevalence of malnutrition risk in older persons within a Maltese rehabilitation hospital.* This study is being supervised by Dr Maria Aurora Fenech, from the Department of Gerontology.

The study is divided into two parts, one part will seek to determine the prevalence of malnutrition risk in older people aged 65 years or over admitted at Karin Grech Rehabilitation Hospital (KGRH) and establish if older persons identified as at risk of malnutrition were referred to the Department of Nutrition and Dietetics for nutrition management. This will be achieved by accessing, retrieving and recording, from the medical files of the older persons, the Mini Nutritional Assessment – Short Form score, the age, gender and if the person was referred to the Department of Nutrition and Dietetics for nutritional management.

The other part of the study will seek to evaluate the knowledge of nurses working KGRH, regarding malnutrition in older persons. This aim will be achieved by inviting nurses working on the wards at KGRH to fill a questionnaire on malnutrition, together with a demographic information sheet on participants' characteristics, e.g. age and gender.

Ethical approval to conduct this study has been granted from both the Faculty Research Ethics Committee at the University of Malta, the ethics board at KGRH and the data protection officer KGRH. Permission to recruit nurses from the wards at KGRH has also been granted from the Chief Nursing Manager KGRH.

Through this information sheet, I would like to invite you to participate in this study by signing the consent forms, and personally filling the Knowledge of Malnutrition - Geriatric (KoM-G) questionnaire and the demographic information sheet. These will take10 minutes to complete and only information essential for this study will be asked. You will not be required to identify yourself in the questionnaire and the demographic information sheet. Therefore, both anonymity and confidentiality will be guaranteed, both during the data collection stage and in any publication that will arise from this

study. There are no foreseen risks or discomfort both physical and psychological for the potential participants.

Your input in the study will be appreciated as it will help increase the necessary awareness on this very important topic. However, it is up to you to decide whether or not to participate in this study. If you refuse to participate, no penalty will be imposed. Moreover, you can withdraw at any time during the study without prejudice.

If you agree to participate in this study, kindly contact me on the e-mail or mobile number hereunder. When contact is established you will be required to sign two informed consent sheets, one to be kept by yourself and one for the researcher. You will then be able to fill in the KoM-G questionnaire and demographic information sheet. You can fill these at your convenience and deposit them together with one copy of the consent form in the survey box provided in the ward. The box will be collected by the researcher on 31th August, 2018.

The collected data will be coded and stored separately from the consent forms. All questionnaires will be kept in a secured place, access to which will be solely to the researcher. Only if necessary, for verification purposes, will this information be accessible to the supervisor, examiner and reviewers. All data will be processed in a fair and lawful way and once the study will be completed all questionnaires will be destroyed.

May I finally remind you that under the Data Protection Act, you can access, modify and erase data concerning yourself. In this regard and should you require any further information or have any queries about the study do not hesitate to contact me on the below contact details. Whilst your participation in this study will be greatly appreciated, I thank you for the time taken to read this information sheet.

Your Sincerely,

Maria Schembri

Researcher: Maria Schembri
e-mail: maria.b.schembri.99@um.edu.mt
Mobile: 79620044

Supervisor: Dr Maria Aurora Fenech
e-mail: maria-aurora.fenech@um.edu.mt
Telephone: 23403187

APPENDIX J

Consent Form for Nurses Maltese Version

Formola ta' Kunsens għall-Infermiera Parteċipanti

Għażiż Sinjur/a,

Jiena, hawn taħt iffirmat, qrajt u fhimt il-Folja ta' Informazzjoni għall-Infermiera Parteċipanti provduta. Nifhem li l-parteċipazzjoni tiegħi fl-istudju ta' riċerka intitolat *L-għarfien tal-infermiera u l-prevalenza tar-riskju ta' malnutrizzjoni f'persuni anzjani fi sptar ta' riabilitazzjoni Malti* hija volontarja u li nista' nirtira mill-istudju f'kull ħin, mingħajr preġudizzju.

Jiena naf li l-iskop ta' dan l-istudju ta' riċerka huwa li jistabbilixxi l-prevalenza tar-riskju tal-malnutrizzjoni f'persuni bl-eta ta' 65 sena jew aktar, li ġew ammessi fl-Isptar għar-Rijabilitazzjoni Karin Grech u biex jistabbilixxi jekk persuni anzjani identifikati bħala f'riskju ta' malnutrizzjoni ġewx riferuti lid Dipartiment tan-Nutrizzjoni u Dietetika għall-immaniġġjar tan-nutrizzjoni. Nirrikonoxxi li l-istudju se jevalwa wkoll l-għarfien ta' infermiera li jaħdmu fl-istess entità fir-rigward tal-malnutrizzjoni fil-popolazzjoni ġerjatrika. Il-parteċipazzjoni tiegħi tinvolvi l-mili ta'darba ta' kwestjonarju u folja ta' informazzjoni demografika, li se jieħdu 10 minuti biex jitlestew. Informazzjoni essenzjali biss għall-fini ta' dan l-istudju se tintalab. Meta nimla l-kwestjonarju, u l-folja ta' informazzjoni demografika, jien ser niddepżithom flimkien mal-formula tal-kunsens fil-kaxxa tal-istħarriġ issiġillata ipprovduta fuq is-sala. Jien se nżomm formola tal-kunsens iffirmata għalija nnifsi.

Jien ġejt infurmat li m'hemm l-ebda riskju jew skumdità previsti, kemm fiżiċi kif ukoll psikoloġiċi, jekk nieħu sehem f'dan l-istudju. Mat-tlestija tal-istudju ta' riċerka, ir-riċerkatur biħsiebha tippreżenta d-dissertazzjoni kompluta lill-ġestjoni tal-isptar.

Barra minn hekk, ġejt assigurat li mhux ser niġi dentifikat bl-ebda mod fil-kwestjonarju u fi kwalunkwe pubblikazzjoni futura, li se toħroġ mill-istudju. Id-data miġbura se tiġi kodifikata u maħżuna separatament mill-formuli tal-kunsens. L-informazzjoni kollha tinżamm kunfidenzjali u sigura, aċċess għaliha se jkun disponibbli għar-riċerkatriċi u biss jekk ikun meħtieġ, u għal skopijiet ta' verifika, din l-informazzjoni tkun aċċessibbli għas-superviżur, l-eżaminatur u r-reviżuri. Barra minn hekk, nirrikonoxxi li taħt l-Att dwar il-Protezzjoni tad-Data għandi d-dritt ta' aċċess, modifika u tħassir ta' kwalunkwe informazzjoni mogħtija. Nifhem ukoll li d-data provduta se tiġi pproċessata b'mod ġust u legali u d-data kollha se tinqered wara li jitlesta l-istudju.

Finalment, fil-każ li għandi bżonn aktar informazzjoni, nista' nikkuntattja lir-riċerkatriċi u / jew lis-superviżur, permezz tad-dettalji ta' kuntatt hawn taħt.

Firma tal-parteċipant/a: _____

Riċerkatriċi: Maria Schemrbi   Firma: _____

E-mail: maria.b.schembri.99@um.edu.mt   Mobajl: 79620044

Supervisur: Dr Maria Aurora Fenech   Firma: _____

E-mail: maria-aurora.fenech@un.edu.mt   Telefon: 23401837

APPENDIX K

Consent Form for Nurses English Version

Consent Form for Nursing Participants

Dear Sir/Madam,

I, the undersigned, have read and understood the Information Sheet for Nursing Participants provided. I understand that my participation in the research study entitled *Nurses' knowledge and prevalence of malnutrition risk in older persons within a Maltese rehabilitation hospital* is voluntary and that I can withdraw from the study at any time, without prejudice.

I know that the purpose of this research study is to establish the prevalence of malnutrition risk in people aged 65 years and over, admitted at Karin Grech Rehabilitation Hospital (KGRH) and to establish if older persons identified as at risk of malnutrition were referred to the Department of Nutrition and Dietetics for nutrition management. I acknowledge that the study will also evaluate the knowledge of nurses working at the same entity regarding malnutrition in the geriatric population. My participation will entail filling a onetime questionnaire and demographic information sheet, which will take 10 minutes to complete. Only information essential for the purpose of this study will be asked. Upon completing the questionnaire and demographic sheet, I will deposit them together with a signed consent form in the sealed survey box provided on the ward. I will keep one signed consent form for myself.

I have been informed that there are no foreseen risks or discomfort, both physical and psychological, if I participate in this study. Upon completion of the research study, the researcher intends to present the completed dissertation to the hospital management.

Furthermore, I have been assured that I will not be identified in any way through the questionnaire and in any future publications, which will arise from the study. The collected data will be coded and stored separately form the consent forms. All the information will be kept confidential and safe, access to which will be available to the researcher and only if necessary, and for verification purposes, will this information be accessible to the supervisor, examiner and reviewers. Moreover, I acknowledge that under the Data Protection Act I have the right to access, modify and erase any information given. I also understand that the data provided will be processed fairly and lawfully and all the data will be destroyed upon completion of the study.

Finally, in case I need further information, I can contact the researcher and/or the supervisor, through contact details hereunder.

Signature of participant: _____

Researcher:	Maria Schembri	Signature:
E-mail:	maria.b.schmebri.99@um.edu.mt	Mobile: 79620044
Supervisor:	Dr Maria Aurora Fenech	Signature:
E-mail:	maria-aurora.fenech@um.edu.mt	Telephone: 23403187

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APPENDIX L

Information Sheet for Older Person Maltese Version

Folja ta' Informazzjoni għall-Persuni Anzjani

Għażiż/a Sinjur/a,

Jiena Maria Schembri, attwalment studenta ta' l-Università ta' Malta, naħdem għ…
ċertifikat tal-Master fil-Ġerontoloġija u fil-Ġerjatrija mal-Fakulta tal-Benesseri Soċj…
Bħala parti mill-esekuzzjoni għal dan il-kors, qed inwettaq studju intitolat *L-għarfien t…*
infermiera u l-prevalenza tar-riskju ta' malnutrizzjoni f'persuni anzjani fî sptar …
riabilitazzjoni Malti. Dan l-istudju qed jiġi sorveljat minn Dr Maria Aurora Fenech, m…
Dipartiment tal-Ġerontoloġija.

L-istudju huwa maqsum f'żewġ partijiet, parti waħda se tfittex li tevalwa l-għarfien ta'
l-infermiera li jaħdmu fl-Isptar għar-Rijabilitazzjoni Karin Grech (SRKG), dwar il-
malnutrizzjoni fil-popolazzjoni ġerjatrika. Dan l-għan ser jinkiseb billi l-infermiera li
jaħdmu fuq is-swali fl-SRKG ser jintalbu li jimlew kwestjonarju dwar il-malnutrizzjoni
fil-popolazzjoni ġerjatrika flimkien ma' folja ta' informazzjoni demografika.

Il-parti l-oħra ta' l-istudju ser tfittex li tistablixxi l-prevalenza tar-riskju ta'
malnutrizzjoni f'persuni li għandhom 65 sena u aktar, ammessi fl-SRKG u jiddetermina
jekk persuni anzjani identifikati li qiegħdin f'riskju ta' malnutrizzjoni ġewx riferuti lid-
Dipartiment tan-Nutrizzjoni u Dietetika għall-immaniġġjar tan-nutrizzjoni. Għal dan il-
għan, jien neħtieġ il-permess tiegħek biex ikolli aċċess għall-fajl mediku tiegħek u
nirkupra u nirreġistra fuq folja mħejjija apposta, il-punteġġ tal-Mini Nutritional
Assessment – Short Form, l-età, is-sess u jekk int kontx irriferut/a lid-Dipartiment tan-
Nutrizzjoni u Dietetika SRKG.

Jekk jiġi nnotat mid-data miksuba li kont tinsab f'riskju ta' malnutrizzjoni u ma kontx
riferut/a lid-Dipartiment tan-Nutrizzjoni u d-Dietetika SRKG, inti tiġi riferut/a lill-
President Kliniku tal-Ġerjatrija, li min-naħa tiegħu ser jirreferik lid-dietista li taħdem
fid-Dipartiment tan-Nutrizzjoni u d-Dietetika SRKG għal ġestjoni xierqa.

L-approvazzjoni etika biex jitwettaq dan l-istudju ngħatat kemm mill-Kumitat tal-Etika
għar-Riċerka tal-Fakultà fl-Università ta' Malta, mill-bord tal-Etika fl-SRKG kif ukoll
mill-uffiċjal tal-protezzjoni tad-data fl-SRKG.

L-anonimità u l-kunfidenzjalità tal-persuni anzjani se jkunu ggarantiti f'kull ħin, peress
li ebda informazzjoni li tista' tidentifika lilek bħala l-persuna anzjana ma tkun
irreġistrata, kemm matul il-proċess tal-ġbir tad-data kif ukoll fi kwalunkwe
pubblikazzjoni li toħroġ minn dan l-istudju. M'hemm l-ebda riskji fiżiċi jew psikoloġiċi
jew skumdità previsti billi taċċetta li tippparteċipa f'dan l-istudju.

Il-kontribut tieghek fl-istudju huwa apprezzat, madankollu id-deċiżjoni jekk tiehux s'hemm jew le f'dan l-istudju tibqa f'idejk. Jekk tirrifjuta li tipparteċipa, ma tiġi imposta ebda penali. Barra minn hekk tista' tirtira fi kwalunkwe hin matul l-istudju minghajr edba preġudizzju.

Jekk taqbel li tipparteċipa f'dan l-istudju, il *gatekeeper* ser tinforma lir- riċerkatriċi. Ir-riċerkatriċi tispjegalek l-istudju fid-dettal. Inti tkun mitlub tiffirma żewġ karti tal-kunsens infurmaṭiv, wahda li ghandha tinżamm minnek u ohra ghar-riċerkatriċi.

Id-data miġbura se tiġi kodifikata u mahżuna separatament mill-formoli tal-kunsens. Id-data kollha ser tinżamm f'post sikur, aċċess ghalijha ikun ghar-riċerkatriċi, u biss jekk ikun mehtieġ u ghal skopijiet ta' verifika, din l-informazzjoni tkun aċċessibbli ghas-superviżur, l-eżaminatur u r-reviżuri. Id-data kollha se tiġi pproċessata b'mod ġust u legali. La darba l-istudju se jitlesta, id-data kollha se tinqered.

Nixtieq finalment niftakar li skond l-Att dwar il-Protezzjoni tad-Data, tista' taċċessa, timmodifika u thassar id-data dwarek. F'dan ir-rigward u jekk ghandek bżonn ta' aktar informazzjoni jew ghandek xi mistoqsijiet dwar l-istudju, toqghodx lura milli tikkuntattjani fuq id-dettalji ta' kuntatt li ġejjin. Filwaqt li l-parteċipazzjoni tieghek f'dan l-istudju se tkun apprezzata hafna, nirringrazzjak tal-hin li hadt biex taqra din il-folja ta' informazzjoni.

Dejjem tieghek,

Maria Schembri

Riċerkatriċi: Maria Schembri
e-mail: maria.b.schembri.99@um.edu.mt
Mobajl: 79620044

Superviżur: Dr Maria Aurora Fenech
e-mail:maria-aurora.fenech@um.edu.mt
Telefon: 23403187

APPENDIX M

Information Sheet for Older Person English Version

Information sheet for Older Persons

Dear Sir/Madam,

I am Maria Schembri, currently a University of Malta student, reading for a Master of Gerontology and Geriatrics with the Faculty for Social Wellbeing. As part fulfilment for this course, I am conducting a research study entitled *Nurses' knowledge and prevalence of malnutrition risk in older persons within a Maltese rehabilitation hospital*. This study is being supervised by Dr Maria Aurora Fenech, from the Department of Gerontology.

The study is divided in two parts, one part will seek to evaluate the knowledge of nurses working at Karin Grech Rehabilitation Hospital (KGRH), regarding malnutrition in the geriatric population. This aim will be achieved by asking nurses working on the wards at KGRH to fill a questionnaire on malnutrition and a demographics information sheet.

The other part of the study will seek to establish the prevalence of malnutrition risk in persons aged 65 years or over, admitted at KGRH and to establish if older persons identified as at risk of malnutrition were referred to the Department of Nutrition and Dietetics for nutrition management. To this effect, I require your kind permission to access your medical file and retrieve and record on a specially prepared sheet, your Mini Nutritional Assessment – Short Form score, age, gender and if you were referred to the Department of Nutrition and Dietetics KGRH.

Should it be noted from the retrieved data that you were at risk of malnutrition and were not referred to the Department of Nutrition and Dietetics KGRH, you will be referred to the Clinical Chairperson of Geriatrics, who in turn will refer you to a dietitian working at the Department of Nutrition and Dietetics KGRH for appropriate management.

Ethical approval to conduct this study has been granted from both the Faculty Research Ethics Committee at the University of Malta, the ethics board at KGRH and the data protection officer KGRH.

Older persons' anonymity and confidentiality will be guaranteed at all times, since no information which can identify you as the older person will be recorded, both during the data collection process and in any publication that will arise from this study. There are

no foreseen physical or psychological risks or discomfort by accepting to participate in this study.

Your input in the study is appreciated however, it is up to you to decide whether or not to participate. If you refuse to participate, no penalty will be imposed. Moreover, you can withdraw at any time during the study without prejudice.

If you agree to participate in this study, the gatekeeper will inform the researcher. The researcher will explain the research in detail. You will be required to sign two informed consent sheets, one to be kept by yourself and one for the researcher.

The collected data will be coded and stored separately form the consent forms. All data will be kept secured, access to which will be to the researcher and only if necessary and for verification purposes, will this information be accessible to the supervisor, examiner and reviewers. All data will be processed in a fair and lawful way. Once the study will be completed, all data will be destroyed.

May I finally remind you that under the Data Protection Act, you can access, modify and erase data concerning yourself. In this regard and should you require any further information or have any queries about the study, do not hesitate to contact me on the below contact details. Whilst your participation in this study will be greatly appreciated, I thank you for the time taken to read this information sheet.

Your Sincerely,

Maria Schembri

Researcher: Maria Schembri

e-mail: maria.b.schembri.99@um.edu.mt

Mobile: 79620044

Supervisor: Dr Maria Aurora Fenech

e-mail: maria-aurora.fenech@um.edu.mt

Telephone: 23403187

APPENDIX N

Consent Form for Older Person Maltese Version

Formola ta' Kunsens għall-Persuni Anzjani

Għażiż Sinjura / Sinjur,

Jiena, hawn taħt iffirmat, qrajt/Ms Vassallo qratli, u fhimt il-Folja ta' Informazzjoni provdut. Nifhem li l-parteċipazzjoni tiegħi fl-istudju ta' riċerka intitolat *L-għarfien tal-infermiera u l-prevalenza tar-riskju ta' malnutrizzjoni f'persuni anzjani fi sptar ta' riabilitazzjoni Malti* hija volontarja u li nista' nirtira mill-istudju f'kull ħin, mingħajr preġudizzju.

Nifhem li wieħed mill-għanijiet tal-istudju huwa li jevalwa l-għarfien tal-infermiera li jaħdmu fl-Isptar għar-Rijabilitazzjoni Karin Grech (SRKG) dwar il-malnutrizzjoni fil-popolazzjoni ġerjatrika. Filwaqt li l-għan l-ieħor tal-istudju huwa li jistabbilixxi l-prevalenza tar-riskju tal-malnutrizzjoni f'persuni ta' 65 sena jew aktar, ammessi fl-SRKG u jekk il-persuni anzjani identifikati bħala f'riskju ta' malnutrizzjoni ġewx riferuti lid-Dipartiment tan-Nutrizzjoni u Dietetika għall-ġestjoni tan-nutrizzjon.

Qed nagħti l-kunsens infurmat tiegħi lir-riċerkatriċi biex ikollha aċċess għall-fajl mediku tiegħi u tirreġistra il-punteġġ tal-Mini Nutritional Assessment – Short Form, is-sess, l-età u jekk ġejtx irriferut jew le lid-Dipartiment tan-Nutrizzjoni u Dietetika għal ġestjoni tan-nutrizzjoni.

Jekk il-punteġġi tiegħi jkunu ekwivalenti għar-riskju ta' malnutrizzjoni u fin-nuqqas ta' riferiment lid-Dipartiment tan-Nutrizzjoni u Dietetika SRKG, nagħti l-kunsens tiegħi lir-riċerkatriċi biex tgħaddi d-dettalji ta' kuntatt tiegħi lill-President Kliniku tal-Ġerjatrija. Huwa min-naħa tiegħu se jikkuntattja dietista fl-SRKG sabiex l-istat tan-nutrizzjoni tiegħi jiġi ġestit kif meħtieġ.

Ġejt infurmat li m'hemm l-ebda riskju jew skumdità previsti, kemm fiżiċi kif ukoll psikoloġiċi, jekk nieħu sehem f'dan l-istudju. Il-benefiċċju dirett billi nipparteċipa fl-istudju se jkun li jekk ma' l-ammissjoni, nstab li kont f'riskju ta' malnutrizzjoni u ma kontx riferut għal ġestjoni nutrizzjonali, se niġi rreferut lid-dietista sabiex nirċievi l-ġestjoni nutrizzjonali meħtieġa

Barra minn hekk, ġejt assigurat li mhux ser niġi dentifikat bl-ebda mod permezz tad-data miġbura u fi kwalunkwe pubblikazzjoni futura, li tirriżulta mill-istudju. Id-data miġbura se tiġi kodifikata u maħżuna separatament mill-formoli tal-kunsens. L-informazzjoni kollha se tinżamm kunfidenzjali u sikura, aċċess għaliha se jkun disponibbli għar- riċerkatriċi u biss jekk meħtieġ, għal skopijiet ta' verifika, din l-informazzjoni tkun aċċessibbli għas-superviżur, l-eżaminatur u r-reviżuri. Barra minn hekk, nirrikonoxxi li taħt l-Att dwar il-Protezzjoni tad-Data għandi d-dritt ta' aċċess, modifika u tħassir ta' kwalunkwe informazzjoni mogħtija. Nifhem ukoll li d-data provduta se tiġi pproċessata b'mod ġust u legali u d-data kollha se tinqered wara li jitlesta l-istudju.

Finalment, fil-każ li għandi bżonn aktar informazzjoni, nista' nikkuntattja lir-riċerkatriċi u / jew lis-superviżur, permezz tad-dettalji ta' kuntatt hawn taħt.

Firma tal-parteċipant/a: _____

Riċerkatriċi: Maria Schemrbi   Firma: _____

E-mail: maria.b.schembri.99@um.edu.mt   Mobajl: 79620044

Supervisur: Dr Maria Aurora Fenech   Firma: _____

E-mail: maria-aurora.fenech@un.edu.mt   Telefon: 23401837

APPENDIX O

Consent Form for Older Person English Version

Consent Form for Older Persons

Dear Sir/Madam,

I, the undersigned, have read/Ms Vassallo has read to me, and understood the information sheet provided. I understand that my participation in the research study entitled *Nurses' knowledge and prevalence of malnutrition risk in older persons within a Maltese rehabilitation hospital* is voluntary and that I can withdraw from the study at any time, without prejudice.

I understand that one of the aims of the study is to evaluate the knowledge of nurses working at Karin Grech Rehabilitation Hospital (KGRH) regarding malnutrition in the geriatric population. Whilst the other aim of the study is to establish the prevalence of malnutrition risk in people aged 65 years and over, admitted at KGRH and if older persons identified as at risk of malnutrition were referred to the Department of Nutrition and Dietetics for nutrition management.

I am giving my informed consent to the researcher for her to access my medical file retrieve and record the Mini Nutritional Assessment –Short Form score, gender, age and whether or not I was referred to the Department of Nutrition and Dietetics for nutrition management.

Should my scores be tantamount to risk of malnutrition and failing a referral to the Department of Nutrition and Dietetics KGRH, I give my consent to the researcher to forward my contact details to the Clinical Chairperson of Geriatrics. He in turn will contact a dietitian from KGRH so that my nutrition status would be managed as necessary.

I have been informed that there are no foreseen risks or discomfort, both physical and psychological, if I participate in this study. The direct benefit by participating in the study will be that if upon admission, I was found to be at risk of malnutrition and was not referred for nutritional management, I will be referred to the dietitian so that I will receive the necessary nutritional management.

Furthermore, I have been assured that I will not be identified in any way through the collected data and in any future publications, which will arise from the study. The collected data will be coded and stored separately form the consent forms. All the information will be kept confidential and safe, access to which will be available to the researcher and only if necessary, for verification purposes, will this information be accessible to the supervisor, examiner and reviewers. Moreover, I acknowledge that under the Data Protection Act I have the right to access, modify and erase any information given. I also understand that the data provided will be processed fairly and lawfully and all the data will be destroyed upon completion of the study.

Finally, in case I need further information, I can contact the researcher and/or the supervisor, through contact details hereunder.

Signature of participant: _____

Researcher:	Maria Schembri	Signature:
E-mail address:	maria.b.schmebri.99@um.edu.mt	Mobile: 79620044
Supervisor:	Dr Maria Aurora Fenech	Signature: MHfenech
E-mail address:	maria-aurora.fenech@um.edu.mt	Telephone: 23403187

APPENDIX P

Information Sheet for Relative/s or Guardian/s Maltese Version

Folja ta' Informazzjoni għall-Qarib/Qraba / Kustodju/i tal-Persuni Anzjani

Għażiż/a Sinjur/a,

Jiena Maria Schembri, attwalment studenta ta' l-Università ta' Malta, naħdem għaċ ċertifikat tal-Master fil-Ġerontoloġija u fil-Ġerjatrija mal-Fakulta tal-Benesseri Soċjali Bħala parti mill-esekuzzjoni għal dan il-kors, qed inwettaq studju intitolat *L-għarfien tal infermiera u l-prevalenza tar-riskju ta' malnutrizzjoni f'persuni anzjani fi sptar ta riabilitazzjoni Malti*. Dan l-istudju qed jiġi sorveljat minn Dr Maria Aurora Fenech, mid Dipartiment tal-Ġerontoloġija.

L-istudju huwa maqsum f'żewġ partijiet, parti waħda se tfittex li tevalwa l-għarfien ta' l-infermiera li jaħdmu fl-Isptar għar-Rijabilitazzjoni Karin Grech (SRKG), dwar il-malnutrizzjoni fil-popolazzjoni ġerjatrika. Dan l-għan ser jintlaħaq billi l-infermiera li jaħdmu fuq is-swali fl-SRKG ser jintalbu li jimlew kwestjonarju dwar il-malnutrizzjoni fil-popolazzjoni ġerjatrika flimkien ma' folja ta' informazzjoni demografika.

Il-parti l-oħra ta' l-istudju ser itfittex li tistablixxi l-prevalenza tar-riskju ta' malnutrizzjoni f'persuni li għandhom 65 sena u aktar, ammessi fl-SRKG u jiddetermina jekk persuni anzjani identifikati li qiegħdin f'riskju ta' malnutrizzjoni ġewx riferuti lid-Dipartiment tan-Nutrizzjoni u Dietetika għall-immaniġġjar tan-nutrizzjoni. Għal dan il-għan, għandi bżonn il-permess tiegħek biex ikolli aċċess għall-fajl mediku tal-persuna anzjana ammessa fl-SRKG u biex nirkupra u nirreġistra, mill-fajls mediċi tal-persuna anzjana, il-punteġġ tal-Mini Nutritional Assessment – Short Form, l-età, sess u jekk il-persuna anzjana ġietx riferuta lid-Dipartiment tan-Nutrizzjoni u Dietetika.

Jekk jiġi nnotat mid-data miksuba li il-persuna anzjana kienet f'riskju ta' malnutrizzjoni u ma kienitx riferuta lid-Dipartiment tan-Nutrizzjoni u d-Dietetika SRKG, il-persuna anzjana tiġi riferuta lill-President Kliniku tal-Ġerjatrija, li min-naħa tiegħu ser jirreferiha lid-dietista li taħdem fid-Dipartiment tan-Nutrizzjoni u d-Dietetika SRKG għal ġestjoni xierqa.

L-approvazzjoni etika biex jitwettaq dan l-istudju ngħatat kemm mill-Kumitat tal-Etika għar-Riċerka tal-Fakultà fl-Università ta' Malta, mill-bord tal-Etika fl-SRKG kif ukoll mill-uffiċjal tal-protezzjoni tad-data fl-SRKG.

L-anonimità u l-kunfidenzjalità tal-persuna anzjani se tkunu ggarantita f'kull ħin, peress li ebda informazzjoni li tista' tidentifikha bħala l-persuna anzjana ma tkun irreġistrata,

kemm matul il-proċess tal-ġbir tad-data kif ukoll fi kwalunkwe pubblikazzjoni li toħroġ minn dan l-istudju. M'hemm l-ebda riskji fiżiċi jew psikoloġiċi jew skumdità previsti billi taċċetta li tħalli lill-persuna anzjana tipparteċipa f'dan l-istudju.

Il-kontribut tal-persuna anzjana fl-istudju huwa apprezzat madankollu, id-deċiżjoni jekk tħallix lill-persuna anzjana tieħu s'hemm jew le f'dan l-istudju tibqa' f'idejk. Jekk tirrifjuta li tħalli lill-persuna anzjana tieħu s'hemm, ma tiġi imposta ebda penali fuqek jew fuq il-persuna anzjana. Barra minn hekk tista' tirtira lill-persuna anzjana mill-istudju fi kwalunkwe ħin mingħajr edba preġudizzju.

Jekk taqbel li tħalli lill-persuna anzjana tieħu s'hemm f'dan l-istudju, jekk jogħġbok informa lil *gatekeeper*, biex tikkuntattjak lir-riċerkatriċ biex tiltaqgħu. Meta jiġi stabbilit kuntatt l-istudju jiġi spjegat fid-dettal u inti tkun mitlub tiffirma żewġ karti tal-kunsens infurmativ, waħda li għandha tinżamm minnek u oħra għar-riċerkatriċi.

Id-data miġbura se tiġi kodifikata u maħżuna separatament mill-formoli tal-kunsens. Id-data kollha ser tinżamm f'post sikur, aċċess għalijha ikun għar-riċerkatriċi u biss jekk ikun meħtieġ u għal skopijiet ta' verifika, din l-informazzjoni tkun aċċessibbli għas-superviżur, l-eżaminatur u r-reviżuri. Id-data kollha se tiġi pproċessata b'mod ġust u legali. La darba l-istudju se jitlesta, id-data kollha se tinqered.

Nixtieq finalment infakrek li skond l-Att dwar il-Protezzjoni tad-Data, inti tista' taċċessa, timmodifika u tħassar id-data dwar il-persona anzjana. F'dan ir-rigward u jekk għandek bżonn ta' aktar informazzjoni jew għandek xi mistoqsijiet dwar l-istudju, toqgħodx lura milli tikkuntattjani fuq id-dettalji ta' kuntatt li ġejjin. Filwaqt li l-parteċipazzjoni tal-persuna anzjana f'dan l-istudju se tkun apprezzata ħafna, nirringrazzjak tal-ħin li ħadt biex taqra din il-folja ta' informazzjoni.

Dejjem tiegħek,

Maria Schembri

Riċerkatriċi: Maria Schembri

e-mail: maria.b.schembri.99@um.edu.mt

Mobajl: 79620044

Superviżur: Dr Maria Aurora Fenech

e-mail: maria-aurora.fenech@um.edu.mt

Telefon: 23403187

APPENDIX Q

Information Sheet for Relative/s or Guardian/s English Version

Information sheet for Relative/s / Guardian/s of Older Persons

Dear Sir/Madam,

I am Maria Schembri, currently a University of Malta student, reading for a Master of Gerontology and Geriatrics with the Faculty for Social Wellbeing. As part fulfilment for this course, I am conducting a research study entitled *Nurses' knowledge and prevalence of malnutrition risk in older persons within a Maltese rehabilitation hospital.* This study is being supervised by Dr Maria Aurora Fenech, from the Department of Gerontology.

The study is divided in two parts, one part will seek to evaluate the knowledge of nurses working at Karin Grech Rehabilitation Hospital (KGRH), regarding malnutrition in the geriatric population. This aim will be achieved by asking nurses working on the wards at KGRH to fill a questionnaire on malnutrition and a demographic information sheet.

The other part of the study will seek to establish the prevalence of malnutrition risk in persons aged 65 years or over, admitted at KGRH and to establish if older persons identified as at risk of malnutrition were referred to the Department of Nutrition and Dietetics for nutrition management. To this effect, I require your kind permission to access the medical file of the older person admitted at KGRH and to retrieve and record on a specially prepared sheet, the Mini Nutritional Assessment – Short Form score, age, gender and if the older person was referred to the Department of Nutrition and Dietetics KGRH.

Should it be noted from the retrieved data that the older person was at risk of malnutrition and was not referred to the Department of Nutrition and Dietetics KGRH, the older person will be referred to the Clinical Chairperson of Geriatrics, who in turn will refer the person to a dietitian working at the Department of Nutrition and Dietetics KGRH for appropriate management.

Ethical approval to conduct this study has been granted from both the Faculty Research Ethics Committee at the University of Malta, the ethics board at KGRH and the data protection officer KGRH.

Older persons' anonymity and confidentiality will be guaranteed at all times, since no information which can identify her/him as the older person will be recorded, both during the data collection process and in any publication that will arise from this study.

There are no foreseen physical or psychological risks or discomfort by accepting to allow the older person to participate in this study.

The older person input in the study is appreciated however, it is up to you to decide whether or not to allow the older person to participate. If you refuse to allow the older person to participate, no penalty will be imposed on you or on the older person. Moreover, you can withdraw the older person from the study at any time without prejudice.

If you agree to allow the older person to participate in this study, kindly inform the gatekeeper, who will contact the researcher to meet you. When contact is established the study will be explained in detail, you will be required to sign two informed consent sheets, one to be kept by yourself and one for the researcher.

The collected data will be coded and stored separately form the consent forms. All data will be kept secured, access to which will be to the researcher and only if necessary and for verification purposes, will this information be accessible to the supervisor, examiner and reviewers. All data will be processed in a fair and lawful way. Ones the study will be completed, all data will be destroyed.

May I finally remind you that under the Data Protection Act, you can access, modify and erase data concerning the older person. In this regard and should you require any further information or have any queries about the study, do not hesitate to contact me on the below contact details. Whilst the older person's participation in this study will be greatly appreciated, I thank you for the time taken to read this information sheet.

Your Sincerely,

Maria Schembri

Researcher: Maria Schembri   Supervisor: Dr Maria Aurora Fenech

e-mail: maria.b.schembri.99@um.edu.mt   e-mail: maria-aurora.fenech@um.edu.mt

Mobile: 79620044   Telephone: 23403187

APPENDIX R

Consent Form for Relative/s or Guardian/s
Maltese Version

Formola ta' Kunsens għall-Qarib/Qraba / Kustodju/i tal-Persuni Anzjani

Għażiż Sinjura / Sinjur,

Jiena, hawn taħt iffirmat, qrajt/Ms Vassallo qratli, u fhimt il-fuljett ta' informazzjoni provdut. Nifhem li jien volontarjament qiegħed nagħti l-kunsens għall-parteċipazzjoni ta' l-anzjani fl-istudju ta' riċerka intitolat *L-għarfien tal-infermiera u l-prevalenza tar-riskju ta' malnutrizzjoni f'persuni anzjani fi sptar ta' riabilitazzjoni Malti* u li nista' nirtira lill-persuna anzjana mill-istudju f'kull ħin, mingħajr preġudizzju.

Nifhem li wieħed mill-għanijiet tal-istudju huwa li jevalwa l-għarfien tal-infermiera li jaħdmu fl-Isptar għar-Rijabilitazzjoni Karin Grech (SRKG) dwar il-malnutrizzjoni fil-popolazzjoni ġerjatrika. Filwaqt li l-għan l-ieħor tal-istudju huwa li jistabbilixxi l-prevalenza tar-riskju tal-malnutrizzjoni f'persuni ta' 65 sena jew aktar, ammessi fl-istess entita u jekk il-persuni anzjani identifikati bħala f'riskju ta' malnutrizzjoni ġewx riferuti lid-Dipartiment tan-Nutrizzjoni u Dietetika għall-ġestjoni tan-nutrizzjon.

Qed nagħti l-kunsens infurmat tiegħi lir-riċerkatriċi biex hi jkollha aċċess għall-fajl mediku tal-persuna anzjana ammessa f'SRKG, tirkupra u tirreġistra punteġġ mill-Mini Nutritional Assessment –Short Form, is-sess, l-età u jekk il-persuna anzjana ġitx irriferuta lid-Dipartiment tan-Nutrizzjoni u Dietetika għall-ġestjoni tan-nutrizzjoni.

Jekk il-punti jindikaw riskju ta' malnutrizzjoni u fin-nuqqas ta' riferiment lid-Dipartiment tan-Nutrizzjoni u Dietetika SRKG, nagħti l-kunsens tiegħi lir-riċerkatriċi biex tgħaddi d-dettalji ta' kuntatt tal-persuna anzjana lill-President Kliniku tal-Ġerjatrija. Huwa min-naħa tiegħu se jikkuntattja li-dietista minn SRKG sabiex l-istat nutrittiv tal-persuna anzjana jkun immaniġġjat kif meħtieġ.
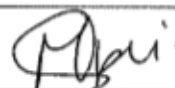
Ġejt infurmat li m'hemm l-ebda riskju jew skumdità previsti, kemm fiżiċi kif ukoll psikoloġiċi, jekk il-persuna anzjana tipparteċipa f'dan l-istudju. Il-benefiċċju dirett billi tipparteċipa fl-istudju se jkun li jekk mad-dħulfl-isptar, il-persuna anzjana nstabet li kienet f'riskju ta' malnutrizzjoni u ma kinitx riferuta għal ġestjoni nutrittiva, hija tiġi rreferuta lid-dietista sabiex il-persuna anzjana tirċievi l-ġestjoni nutrittiva meħtieġa.

Barra minn hekk, kont assigurat li l-persuna anzjana ma tiġi identifikata bl-ebda mod permezz tad-data miġbura u fi kwalunkwe pubblikazzjoni futura, li tirriżulta mill-istudju. Id-data miġbura se tiġi kodifikata u maħżuna separatament mill-formoli tal-kunsens. L-informazzjoni kollha se tinżamm kunfidenzjali u sikura, aċċess għaliha se jkun disponibbli għar-riċerkatriċi u biss jekk meħtieġ, għal skopijiet ta' verifika, din l-informazzjoni tkun aċċessibbli għas-superviżur, l-eżaminatur u r-reviżuri. Barra minn hekk, nirrikonoxxi li taħt l-Att dwar il-Protezzjoni tad-Data għandi d-dritt ta' aċċess, modifika u thassir ta' kwalunkwe informazzjoni li tirrigwarda l-persuna anzjana. Nifhem ukoll li d-data provduta se tiġi pproċessata b'mod ġust u legali u d-data kollha se tinqered wara li jitlesta l-istudju.
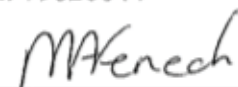
Finalment, fil-każ li għandi bżonn aktar informazzjoni, nista' nikkuntattja lir-riċerkatriċi u / jew lis-superviżur, permezz tad-dettalji ta' kuntatt hawn taħt.

Firma tal-qarib/qraba / kustodju/i: _____

Riċerkatriċi: Maria Schemrbi   Firma: _____
E-mail: maria.b.schembri.99@um.edu.mt   Mobajl: 79620044

Supervisur: Dr Maria Aurora Fenech   Firma: _____
E-mail: maria-aurora.fenech@un.edu.mt   Telefon: 23401837

APPENDIX S

Consent Form for Relative/s or Guardian/s
English Version

Consent Form for Relative/s / Guardian/s of Older Persons

Dear Sir/Madam,

I, the undersigned, have read/Ms Vassallo has read for me, and understood the information sheet provided. I understand that I am voluntary giving consent for the older persons' participation in the research study entitled *Nurses' knowledge and prevalence of malnutrition risk in older persons within a Maltese rehabilitation hospital* and that I can withdraw the older person from the study at any time, without prejudice.

I understand that one of the aims of the study is to evaluate the knowledge of nurses working at Karin Grech Rehabilitation Hospital (KGRH) regarding malnutrition in the geriatric population. Whilst the other aim of the study is to establish the prevalence of malnutrition risk in people aged 65 years and over, admitted at the same entity and to establish if older persons identified as at risk of malnutrition were referred to the Department of Nutrition and Dietetics for nutrition management.

I am giving my informed consent to the researcher for her to access the medical file of the older person admitted at KGRH, retrieve and record the Mini Nutritional Assessment Form –Short Form score, gender, age and whether or not the older person was referred to the Department of Nutrition and Dietetics for nutrition management.
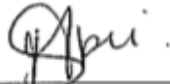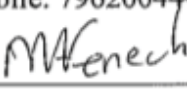
Should the scores be tantamount to risk of malnutrition and failing a referral to the Department of Nutrition and Dietetics KGRH, I give my consent to the researcher to forward the contact details of the older person to the Clinical Chairperson of Geriatrics. He in turn will contact a dietitian from KGRH so that the nutrition status of the older person would be managed as necessary.

I have been informed that there are no foreseen risks or discomfort, both physical and psychological, if the older person participates in this study. The direct benefit by participating in the study will be that if upon admission, the older person was found to be at risk of malnutrition and was not referred for nutritional management, she/he will be referred to the dietitian so that the older person will receive the necessary nutritional management.

Furthermore, I have been assured that the older person will not be identified in any way through the collected data and in any future publications, which will arise from the study. The collected data will be coded and stored separately form the consent forms. All the information will be kept confidential and safe, access to which will be available to the researcher and only if necessary, for verification purposes, will this information be accessible to the supervisor, examiner and reviewers. Moreover, I acknowledge that under the Data Protection Act I have the right to access, modify and erase any information concerning the older person. I also understand that the data provided will be processed fairly and lawfully and all the data will be destroyed upon completion of the study.

Finally, in case I need further information, I can contact the researcher and/or the supervisor, through contact details hereunder.

Signature of relative/s/guardian/s:_____

Researcher:	Maria Schembri	Signature:
E-mail address:	maria.b.schmebri.99@um.edu.mt	Mobile: 79620044
Supervisor:	Dr Maria Aurora Fenech	Signature: MAFenech
E-mail address:	maria-aurora.fenech@um.edu.mt	Telephone: 23403187

APPENDIX T

Questionnaire Feedback Form

Questionnaire Feedback Form

1. Were the instructions how to fill the questionnaire clear? If not explain.

   _____

   _____

   _____

   _____

   _____

2. Were there any question/s which could be misunderstood / not clear? If so kindly indicate.

   _____

   _____

   _____

   _____

   _____

3. Were there any optional answer/s which could be misunderstood / not clear? If so kindly indicate

   _____

   _____

   _____

   _____

   _____

4. How long did it take to fill the questionnaire?

   _____

5. Was the length of time taken to fill the questionnaire acceptable?

   _____

APPENDIX U

Permission to Conduct the Study at KGRH
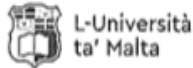
L-Università
ta' Malta   Maria Schembri <maria.b.schembri.99@um.edu.mt>

approval to conduct study at RHKGH
2 messages

Maria Schembri <maria.b.schembri.99@um.edu.mt>   12 April 2018 at 21:34
To: stephen.m.zammit@gov.mt
Cc: Maria Aurora Fenech <maria-aurora.fenech@um.edu.mt>

Dear Dr Zammit,

I am Maria Schembri, currently a University of Malta student, reading for a Master of Gerontology and Geriatrics with the Faculty for Social Wellbeing. As part fulfillment for this course, I would like to conduct a study entitled *Nurses' knowledge and prevalence of malnutrition risk in older persons within a Maltese rehabilitation hospital*. This study is being supervised by Dr Maria Aurora Fenech.

Through this mail I am asking for your approval as the Chief Executive Officer at Rehabilitation Hospital Karin Grech (RHKG) to conduct the aforementioned study in the named hospital.

I will also seek approval to conduct this study from Research Committee RHKG, the Chief Nursing Manager RHKG and the Clinical Chairperson Department of Geriatrics RHKG. All permissions will be passed to the Faculty Research Ethics Committee for their approval to conduct the study.

Attached with this e-mail kindly find attached the research proposal brief for your perusal.

If you need any further information, do not hesitate to contact myself or my supervisor.

Yours sincerely,

Maria Schembri

Master of Gerontology and Geriatrics Student

Virus-free. www.avast.com

Research proposal brief.docx
13K

Zammit Stephen M at Rehabilitation Services-Health <stephen.m.zammit@gov.mt>   13 April 2018 at 08:17
To: Maria Schembri <maria.b.schembri.99@um.edu.mt>
Cc: Maria Aurora Fenech <maria-aurora.fenech@um.edu.mt>

Approved.

Kindly inform Data Protection Officer, Ms R Messina, about the study.

Best of luck.

Stephen

Stephen Zammit
CEO Karin Grech/St. Luke's Hospital

Consultant in Rehabilitation Medicine

t: +356 22081860 e: stephen.m.zammit@gov.mt | Rehabilitation Hospial Karin Grech/St. Luke's Hospital

APPENDIX V

Permission to Recruit Nurses from KGRH

L-Università
ta' Malta

Maria Schembri <maria.b.schembri.99@um.edu.mt>

approval to conduct a study
2 messages

Maria Schembri <maria.b.schembri.99@um.edu.mt>   12 April 2018 at 11:02
To: brigitte.vassallo@gov.mt
Cc: Maria Aurora Fenech <maria-aurora.fenech@um.edu.mt>

Dear Ms Vassallo,

I am Maria Schembri, currently a University of Malta student, reading for a Master of Gerontology and Geriatric with the Faculty for Social Wellbeing. As part fulfillment for this course, I would like to conduct a study entitled *Nurses' knowledge and prevalence of malnutrition risk in older persons within a Maltese rehabilitation hospital.* This study is being supervised by Dr Maria Aurora Fenech.

Through this mail I am asking for your approval as the Chief Nursing Manager Rehabilitation Hospital Karin Grech, to recruit nurses for the aforementioned study at the named hospital.

I am also in the process of obtaining permissions to conduct this study from, the Chief Executive Officer RHKG, the Research Committee RHKG and the Clinical Chairperson Department of Geriatrics RHKG. All permissions will be passed to the University Research Ethics Committee for their approval to conduct the study.

Attached with this e-mail kindly find the research proposal brief, for your perusal.

If you need any further information, do not hesitate to contact myself or my supervisor.

Yours sincerely,

Maria Schembri

Master of Gerontology and Griatrics student

Research proposal brief.docx
13K

Vassallo Brigitte at Rehabilitation Services-Health <brigitte.vassallo@gov.mt>   25 April 2018 at 08:09
To: Maria Schembri <maria.b.schembri.99@um.edu.mt>
Cc: Maria Aurora Fenech <maria-aurora.fenech@um.edu.mt>

Approved

Brigitte Vassallo

Brigitte Vassallo
Chief Nursing Manager
Health-Rehabilitation Services
Rehabilitation Hospital

t +356 22080000 e brigitte.vassallo@gov.mt | https://health.gov.mt
Kindly consider your environmental responsibility before printing this e-mail

MINISTRY FOR HEALTH
ST LUKE'S HOSPITAL, PJAZZA SAN LUQA,
PIETA', MALTA

APPENDIX W

Permission to Recruit Older Persons from KGRH

L-Università
ta' Malta

Maria Schembri <maria.b.schembri.99@um.edu.mt>

Permission to conduct research at RHKG

2 messages

Maria Schembri <maria.b.schembri.99@um.edu.mt>
To: anthony.fiorini@gov.mt
Cc: Maria Aurora Fenech <maria-aurora.fenech@um.edu.mt>

18 April 2018 at 1'

Maria Schembri <maria.b.schembri.99@um.edu.mt>
to anthony.fiorini, Maria

12 Apr (6 days ago)

Dear Dr Fiorini,

I am Maria Schembri, currently a University of Malta student, reading for a Master of Gerontology and Geriatrics with the Faculty for Social Wellbeing. As part fulfillment for this course, I would like to conduct a study entitled *Nurses' knowledge and prevalence of malnutrition risk in older persons within a Maltese rehabilitation hospital.* This study is being supervised by Dr Maria Aurora Fenech.

Through this mail, I am asking for your approval as the **Clinical Chairperson Department of Geriatrics Rehabilitation Hospital Karin Grech (RHKG)** and the person directly responsible for the patients, to conduct the aforementioned study at the named hospital.

I have also applied for permission to conduct the study from the Chief Executive Officer RHKG and am also seek approval from the Research Committee RHKG and the Chief Nursing Manager RHKG. All permissions will be passed to the Faculty Research Ethics Committee for their approval to conduct the study.

Attached with this e-mail kindly find attached the research proposal brief', for your perusal.

If you need any further information, do not hesitate to contact myself or my supervisor.

Yours sincerely,

Maria Schembri

Master of Gerontology and Geriatrics student

Research proposal brief.docx
14K

Fiorini Anthony at Rehabilitation Services-Health <anthony.fiorini@gov.mt>
To: Maria Schembri <maria.b.schembri.99@um.edu.mt>

18 A

Dear Ms Schembri,

As Clinical Chairperson of the Department of Geriatrics, I confirm that you can proceed with your planned study at RHKG.

Dr Anthony Fiorini

From: Maria Schembri [mailto:maria.b.schembri.99@um.edu.mt]
Sent: Wednesday, 18 April 2018 11:59
To: Fiorini Anthony at Rehabilitation Services-Health
Cc: Maria Aurora Fenech
Subject: Permission to conduct research at RHKG

Maria Schembri <maria.b.schembri.99@um.edu.mt>

12 Apr (6 days ago)

APPENDIX X

Permission to Translate and Use the KoM-G Questionnaire

L-Università
ta' Malta

Maria Schembri <maria.b.schembri.99@um.edu.mt>

Permission to use and translate the KoM-G questionnaire

3 messages

Maria Schembri <maria.b.schembri.99@um.edu.mt>
To: christa.lohrmann@medunigraz.at
Cc: Maria Aurora Fenech <maria-aurora.fenech@um.edu.mt>

22 April 2018 at 08:20

Dear Dr Lohrmann,

I hope this mail finds you in good health.
I am Maria Schembri, currently reading for a Master of Gerontology and Geriatrics with the University of Malta. As part fulfillment for this course I would like to conduct a study entitled Nurses' knowledge and prevalence of malnutrition risk in older persons within a Maltese rehabilitation hospital. This study is being supervised by Dr Maria Aurora Fenech.

With great interest I have ready your study entitled *Knowledge and attitudes of nursing staff towards malnutrition are in nursing homes: A multicentre cross-sectional study.* Where you developed and used the Knowledge of Malnutrition- Geriatrics questionnaire (KoM-G).

I would like to ask you, as one of the authors of the KoM-G questionnaire, permission to use this research tool in my study and to translate it to the Maltese language.

Whilst I hope that you will grant me the above requested permissions, I assure you that in my study write up I will acknowledge the original authors of the tool.

If you need any further information, do not hesitate to contact me.

Yours sincerely,
Maria Schembri
Master of Gerontology and Geriatrics Student

Lohrmann, Christa <christa.lohrmann@medunigraz.at>
To: Maria Schembri <maria.b.schembri.99@um.edu.mt>

23 April 2018 at 11:41

Dear Mrs Schembri, thank you for your email and request to use the KoM-G questionnaire. As co-author I give you the permission in the name of Dr. Silvia Bauer (Schoenherr) to translate and to use the questionnaire. Please note, if you are writing articles etc. about your study please give references to the original author. Thank you. I will send you the English version as soon as possible. Sincerely Christa Lohrmann

Von: Maria Schembri <maria.b.schembri.99@um.edu.mt>
Gesendet: Sonntag, 22. April 2018 08:20
An: Lohrmann, Christa <christa.lohrmann@medunigraz.at>
Cc: Maria Aurora Fenech <maria-aurora.fenech@um.edu.mt>
Betreff: Permission to use and translate the KoM-G questionnaire

[Quoted text hidden]

Maria Schembri <maria.b.schembri.99@um.edu.mt>
To: "Lohrmann, Christa" <christa.lohrmann@medunigraz.at>
Cc: Maria Aurora Fenech <maria-aurora.fenech@um.edu.mt>

23 April 2018 at 11:57

Dear Dr Lohrmann,

Thank you for your reply. Much appreciated. I will give reference to the author of the tool in all my writing.

Yours Sincerely,

Maria Schembri
Master of Gerontology and Geriatrics Student
[Quoted text hidden]

APPENDIX Y

Research Committee KGRH Approval

L-Università
ta' Malta

Maria Schembri <maria.b.schembri.99@um.edu.mt>

Permission to conduct study at RHKG

2 messages

Maria Schembri <maria.b.schembri.99@um.edu.mt>
To: anthony.fiorini@gov.mt
Cc: Maria Aurora Fenech <maria-aurora.fenech@um.edu.mt>

18 April 2018 at 11:57

Dear Dr Fiorini,

I am Maria Schembri, currently a University of Malta student, reading for a Master of Gerontology and Geriatrics with the Faculty for Social Wellbeing. As part fulfilment for this course, I would like to conduct a study entitled *Nurses' knowledge and prevalence of malnutrition risk in older persons within a Maltese rehabilitation hospital*. This study is being supervised by Dr Maria Aurora Fenech.

The aim of this study is to establish the prevalence of malnutrition risk in people aged 65 years and over, admitted at RHKG and to evaluate the knowledge of nurses working at the same entity regarding malnutrition in the geriatric population.

A brief of the research proposal is attached with this mail for the committee perusal.

Through this mail I am asking for approval from **Rehabilitation Hospital Karin Grech (RHKG) Research Committee** to:

1. carry out this study at RHKG
2. have access to participants
3. have access to data.

All gatekeepers will be informed of this study and their permission to act as gatekeepers will be sought. Additionally, permission from the Chief Executive officer RHKG, the Chief Nursing Manger RHKG and the Clinical Chairperson Department of Geriatrics RHKG will be sought to conduct this study. All the permissions will be sent to the Faculty Research Ethics Committee (FREC) together with the application to conduct this study. No data collection will be carried out prior to obtaining permission to conduct this study from FREC.

Whilst awaiting a positive reply, do not hesitate to contact me or my supervisor should the committee require any further information.

Yours Sincerely,

Maria Schembri

Master of Gerontology and Geriatrics Student

Research proposal brief.docx
14K

Fiorini Anthony at Rehabilitation Services-Health <anthony.fiorini@gov.mt>
To: Maria Schembri <maria.b.schembri.99@um.edu.mt>

18 April 2018 at 12:02

Dear Ms Schembri,

The members of the Research Committee at RHKG have agreed that you can proceed with your proposed study at the hospital.

Dr Anthony Fiorini,

On behalf of the Research Committee.

https://mail.google.com/mail/u/1/?ui=2&ik=89b14f526f&jsver=nx1TiW6LG3A.en_GB.&view=pt&search=inbox&th=162d8347a511388b&siml=162d8300817

APPENDIX Z

Data Protection Officer KGRH Approval

L-Università
ta' Malta

Maria Schembri <maria.b.schembri.99@um.edu.mt>

permission to collect data from nurses and clients' medical file
3 messages

Maria Schembri <maria.b.schembri.99@um.edu.mt>   18 April 2018 at 12:32
To: roberta.messina@gov.mt
Cc: Maria Aurora Fenech <maria-aurora.fenech@um.edu.mt>

Dear Ms Messina,

I am Maria Schembri, currently a University of Malta student, reading for a Master of Gerontology and Geriatrics with the Faculty for Social Wellbeing. As part fulfillment for this course, I would like to conduct a study entitled *Nurses' knowledge and prevalence of malnutrition risk in older persons within a Maltese rehabilitation hospital.* This study is being supervised by Dr Maria Aurora Fenech.

Through this mail I am asking for your permission as the Data Protection Officer at Rehabilitation Hospital Karin Grech (RHKG) to:

1. Give nurses working on the wards at RHKG a Knowledge of Malnutrition - Geriatrics questionnaire and consent forms to participate in the study after they would have been informed and invited to participate in the study by a gatekeeper.
2. Have access to the medical file of the persons admitted at RHKG and retrieve from the file the Mini Nutritional Assessment - Short Form (MNA-SF) score, the person's gender, age and if the person was referred to the Department of Nutrition and Dietetics for malnutrition assessment. Attached is the form that would be used to collect this information. No other information will be record for any person.

All the information collected both from the nurses' questionnaire as well as that retrieved from the medical files will all be kept confidential. All data will be kept securely in a locked drawer, access to which is only to the researcher. Moreover, all the collected data will be disposed of upon successful publication of the dissertation results.

I already have been granted permission to conduct this study from the RHKG Research Ethics Committee, from Dr Zammit as the Chief Executive Officer RHKG and from Dr Fiorini as the Chairperson Department of Geriatrics RHKG (kindly find attached). All permissions will be passed to the University Research Ethics Committee for their approval to conduct the study. No data collection will be started before obtaining all the required permissions.

Attached with this e-mail kindly find the research proposal brief, for your perusal.

If you need any further information, do not hesitate to contact myself or my supervisor.

Yours sincerely,

Maria Schembri
Master of Gerontology and Geriatrics student

5 attachments

- **Research proposal brief.docx**
  14K

- **approval from Dr Zammit CEO RHKG.docx**
  20K

- **Permission to conduct study at RHKG by Research ethics committee.docx**
  16K

- **Permission to conduct research at RHKG by Dr Fiorini.docx**
  16K

- **data collection form.docx**
  12K

Messina Roberta at Rehabilitation Services-Health <roberta.messina@gov.mt>   18 April 2018 at 15:07

188

To: Maria Schembri <maria.b.schembri.99@um.edu.mt>

Dear Ms.Schembri

Can you please forward the actual email sent to you by Dr.Fiorini?

Regards

Roberta Messina

DPO

RHKG

Roberta Messina
Senior Pharmacist
Health-Rehabilitation Services
Rehabilitation Hospital

t +356 22081270   e roberta.messina@gov.mt
https://health.gov.mt | www.publicservice.gov.mt
Valletta 2018 - European Capital of Culture   www.valletta2018.org
Kindly consider your environmental responsibility before printing this email

MINISTRY FOR HEALTH

ST LUKE'S HOSPITAL, PJAZZA SAN LUQA.
PIETA', MALTA

From: Maria Schembri [mailto:maria.b.schembri.99@um.edu.mt]
Sent: Wednesday, 18 April 2018 12:33
To: Messina Roberta at Rehabilitation Services-Health
Cc: Maria Aurora Fenech
Subject: permission to collect data from nurses and clients' medical file

[Quoted text hidden]

image001.jpg
24K

Maria Schembri <maria.b.schembri.99@um.edu.mt>   18 April 2018 at 17:24
To: Messina Roberta at Rehabilitation Services-Health <roberta.messina@gov.mt>
Cc: Maria Aurora Fenech <maria-aurora.fenech@um.edu.mt>

Dear Ms Messina,

Sure will forward e-mail.

Regards,
Maria Schembri
[Quoted text hidden]

image003.jpg
2K

L-Università ta' Malta

Maria Schembri <maria.b.schembri.99@um.edu.mt>

Permission to conduct study at RHKG

4 messages

Maria Schembri <maria.b.schembri.99@um.edu.mt>   18 April 2018 at 11:57
To: anthony.fiorini@gov.mt
Cc: Maria Aurora Fenech <maria-aurora.fenech@um.edu.mt>

Dear Dr Fiorini,

I am Maria Schembri, currently a University of Malta student, reading for a Master of Gerontology and Geriatrics with the Faculty for Social Wellbeing. As part fulfilment for this course, I would like to conduct a study entitled *Nurses' knowledge and prevalence of malnutrition risk in older persons within a Maltese rehabilitation hospital.* This study is being supervised by Dr Maria Aurora Fenech.

The aim of this study is to establish the prevalence of malnutrition risk in people aged 65 years and over, admitted at RHKG and to evaluate the knowledge of nurses working at the same entity regarding malnutrition in the geriatric population.

A brief of the research proposal is attached with this mail for the committee perusal.

Through this mail I am asking for approval from **Rehabilitation Hospital Karin Grech (RHKG) Research Committee** to:

1. carry out this study at RHKG
2. have access to participants
3. have access to data.

All gatekeepers will be informed of this study and their permission to act as gatekeepers will be sought. Additionally, permission from the Chief Executive officer RHKG, the Chief Nursing Manger RHKG and the Clinical Chairperson Department of Geriatrics RHKG will be sought to conduct this study. All the permissions will be sent to the Faculty Research Ethics Committee (FREC) together with the application to conduct this study. No data collection will be carried out prior to obtaining permission to conduct this study from FREC.

Whilst awaiting a positive reply, do not hesitate to contact me or my supervisor should the committee require any further information.

Yours Sincerely,

Maria Schembri

Master of Gerontology and Geriatrics Student

📄 **Research proposal brief.docx**
    14K

Fiorini Anthony at Rehabilitation Services-Health <anthony.fiorini@gov.mt>   18 April 2018 at 12:02
To: Maria Schembri <maria.b.schembri.99@um.edu.mt>

Dear Ms Schembri,

The members of the Research Committee at RHKG have agreed that you can proceed with your proposed study at the hospital.

Dr Anthony Fiorini,

On behalf of the Research Committee.

From: Maria Schembri [mailto:maria.b.schembri.99@um.edu.mt]
Sent: Wednesday, 18 April 2018 11:57
To: Fiorini Anthony at Rehabilitation Services-Health
Cc: Maria Aurora Fenech
Subject: Permission to conduct study at RHKG

[Quoted text hidden]

Maria Schembri <maria.b.schembri.99@um.edu.mt>   18 April 2018 at 17:28
To: roberta.messina@gov.mt
Cc: Maria Aurora Fenech <maria-aurora.fenech@um.edu.mt>

Dear Ms Messina,

Kindly find e-mail from the research ethics committee.

Regards,
Maria Schembri
Masters of Gerontology and Geriatrics student
[Quoted text hidden]

Messina Roberta at Rehabilitation Services-Health <roberta.messina@gov.mt>   19 April 2018 at 07:27
To: Maria Schembri <maria.b.schembri.99@um.edu.mt>

Dear Ms.Schembri

Thank you for your email. I hereby forward approval as Data Protection Officer. Kindly note that you are to abide by all clauses in the Data Protection Act including the sections related to Research. You are to ensure that the officer in charge of the section that you are retrieving information from is updated on the progress of your research at all times. You are to declare the retention time for the data collected prior to starting data collection. Do not hesitate to contact me should you require any further guidance.

Regards

Roberta Messina

DPO

RHKG

From: Maria Schembri [mailto:maria.b.schembri.99@um.edu.mt]
Sent: Wednesday, 18 April 2018 17:28
To: Messina Roberta at Rehabilitation Services-Health
Cc: Maria Aurora Fenech
Subject: Fwd: Permission to conduct study at RHKG

[Quoted text hidden]

APPENDIX ZA

Ethical Clearance FREC UOM

To be completed by Faculty Research Ethics Committee

We have examined the above proposal and advise

(Acceptance)   Refusal   Conditional acceptance

For the following reason/s:

All requested changes have been made

Signature _(signed)_   Date   28/6/18

To be completed by University Research Ethics Committee

We have examined the above proposal and grant

Acceptance   Refusal   Conditional acceptance

For the following reason/s:

NOT APPLICABLE

Signature   Date

193