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DoNCP: Incorporating step two of the Nutrition Care Process into hospital dietetic practice using an implementation package

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Incorporating Step Two of the Nutrition Care Process into Hospital Dietetic Practice Using an Implementation Package

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ABSTRACT

The Nutrition Care Process (NCP) and accompanying International Dietetic and Nutrition Terminology (IDNT) has been endorsed internationally as the standard model for nutrition care. However, there is limited published Australian literature on the implementation of the NCP and IDNT including the attitudes, knowledge and support requirements of dietitians to facilitate this. This study aimed to develop and test a survey to assess attitudes, support and knowledge of NCP and use the findings in conjunction with literature to design and implement a NCP package and evaluate the package.

The research was conducted in two phases: (1) formative research to inform development of the implementation package, and (2) implementation and evaluation. Phase One involved dietitians from two hospitals who had undergone informal NCP implementation in Queensland (termed “post-implementers”) and three hospitals in Western Australia who were yet to implement the NCP (termed “pre-implementers”) completing an online questionnaire, Attitudes Support Knowledge NCP survey (ASK NCP). This questionnaire surveyed demographics, knowledge, familiarity, confidence, support, value, barriers and training requirements for NCP. From this a NCP implementation package and resources were developed for the implementation of step two of the NCP specifically, in conjunction with literature and a change management framework. In Phase Two, the NCP implementation package was implemented over a 5-month period at two test hospitals that were yet to undergo implementation, whilst a control hospital did not receive the package. Evaluation occurred by re-administering the ASK NCP survey to the test and control sites and by conducting focus groups at the test sites.

The fist phase of the study demonstrated that post-implementers had higher knowledge scores, were more familiar with NCP and more confident to implement then pre-implementers. Time required to implement was a concern for all participants. Lack of knowledge, training/support and resources were barriers to implementation for the pre-implementers. Post-

implementers identified that dedicated time to practice and regular tutorials; support and leadership from management; and professional growth through understanding how change could benefit practice were keys to successful implementation. Phase Two showed that the resulting NCP implementation package led to significantly higher NCP knowledge scores and confidence to use step two in practice within the test group. Emerging themes from focus groups included the usefulness of the package to build confidence, the value of education and resources, peer support and leadership team establishment.

This research has resulted in the development of a structured NCP implementation package focusing on step two of the NCP, for hospital dietitians that utilises a change management framework to support NCP in practice. The evaluation of the package provides support for future implementation of NCP in clinical dietetic practice.

DECLARATION

I hereby certify that the work embodied in this thesis is the result of original research, which was completed subsequent to admission to candidature for the degree of Masters of Public Health by Research. The thesis does not, to the best of my knowledge and belief: incorporate without acknowledgement any material previously submitted for a degree or diploma in any institution of higher education; contain any material previously published or written by another person except where due reference is made in the text of this thesis; or contain any defamatory material.

Jane Porter

STATEMENT OF CONTRIBUTION BY OTHERS

I would like to acknowledge the contribution of others to the research.

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LIST OF ABBREVIATIONS

ADA	American Dietetic Association (pre-2013). From 2013 they changed their name to the Academy Nutrition and Dietetics (AND), however, for the purpose of consistency within the thesis ADA is the abbreviation used.
ASK NCP	Attitudes, Support and Knowledge of NCP
DAA	Dietitians Association of Australia
DAR	Diagnosis, assessment, recommendation
NCP	Nutrition Care Process
ICD	International Classification of Diseases
ICD-10 AM	International Classification of Diseases Australian Modification
ICF	International Classification of Functioning, Disability and Health
IDNT	International Dietetic and Nutrition Terminology
IFI	Indicator for Intervention
MWU	Mann-Whitney U
PES	Problem, etiology, signs and symptoms
PIE	Problem, intervention, evaluation
QLD	Queensland
SNOMED CT	Systemised Nomenclature of Medicine Clinical Terms
SOAP	Subjective, Objective, Assessment, Plan
USA	United States of America
WA	Western Australia
WSR	Wilcoxon signed rank

CHAPTER 1

INTRODUCTION

1.1 OVERVIEW AND RESEARCH PROBLEM

Dietetics is a diverse profession. In Australia, dietetics contributes to the promotion of health and treatment of illness through nutrition optimisation of communities and individuals (Dietitians Association of Australia, 2014). As a profession, dietetics is continually evolving in response to a variety of situations including, new evidence, best practice, role expansion and health care reforms.

1.1.1 The Nutrition Care Process (NCP) and International Dietetic and Nutrition Terminology (IDNT)

In 2009, the Dietitians Association of Australia (DAA) recommended adoption of the American Dietetic Association (ADA) Nutrition Care Process (NCP) and International Dietetic and Nutrition Terminology (IDNT) for use in Australia. The NCP is a systematic problem-solving framework that uses a critical thinking and decision-making process to address practice related problems (American Dietetic Association, 2008). The NCP was initially developed in the United States of America (USA), and the framework consists of four distinct steps: nutrition assessment, diagnosis, intervention and monitoring and evaluation (Lacey and Pritchett, 2003). It is designed to improve the consistency and quality of individualised care for patients, and the predictability of the patient outcomes (American Dietetic Association, 2009). The IDNT was developed in conjunction with the NCP to describe the unique function of dietetics within the four NCP steps with specific terminology. The NCP and IDNT have been supported as the international standard by the International Confederation of Dietetic Associations, of which DAA is a member.

1.1.2 Applications of NCP and IDNT

The NCP has many applications within nutrition and dietetics practice. For educators, it provides a framework for teaching dietetic students how to provide nutrition care. In research it can be used to define the data collection and how to structure an intervention. It can also be used as a way to structure grant applications or policy development. For hospital dietitians, utilisation of the NCP framework and application of IDNT provides a clear

nutrition diagnosis as opposed to the medical diagnosis, based on the assessment undertaken, evidenced dietetic intervention, monitoring and evaluation of nutrition care. For example, a medical diagnosis for a patient with diabetes could be Type II Diabetes Mellitus, whereas the specific nutrition diagnosis, the problem that the dietitian is directly addressing, could be excessive carbohydrate intake. The clear identification of a nutrition diagnosis based on the nutrition assessment undertaken provides a framework and drives the choice of nutrition intervention and how the problem will be monitored and evaluated. Using the NCP therefore provides clinical dieitians with not only the nutrition problem but the supporting intervention and evaluation methodology. This framework provides opportunity to improve practice, support concise medical record documentation and improve recognition of dietetics by other practitioners (Haws, 2010; Lacey & Cross, 2002; Skipper, 2007).

1.1.3 Gaps in the Knowledge

In the USA, from 2008, the Commission on Accreditation for Dietetics Education made the NCP a knowledge requirement for didactic education and a competency for supervised practice programs to ensure that entry level registered dietitians were prepared to use NCP and IDNT in practice (Commission on Accreditation for Dietetics Education Academy of Nutrition and Dietetics, 2009). In 2010, the NCP and IDNT were adopted into the DAA National Competency Standards for Entry Level Dietitians (Dietitians Association of Australia, 2010). Despite these requirements, in 2010 prior to this research starting, NCP was not used as standard practice in Australia.

Paper based patient medical records are currently used in West Australian (WA) hospitals. Traditionally, dietitians use the subjective, objective, assessment and plan (SOAP) method to document dietetic practice. After they have seen and assessed a patient, they would document the subjective and objective information relating to the patient, the dietetic assessment and plan of care. A limitation of the SOAP methodology is the lack of the NCP framework or standardised terminology. In addition, monitoring and evaluation are not directly specified. It is therefore difficult to obtain

comparable outcome data from hospital record documentation. Uniform and complete documentation by dietitians is essential to effectively describe, evaluate and coordinate care (Hakel-Smith, Lewis & Eskridge, 2005). Incorporation of the standardised terminology into the workplace is an important aspect of the introduction of electronic health records that, in the future, will allow electronic data capture and comparative analyses within the health system.

It is important for Australian dietitians to move forward and adopt, implement and embed NCP and IDNT within dietetic practice to align with international practice. At the time of this research project, there was knowledge and application to practice information available from the USA, however, there was a gap in the knowledge regarding NCP and IDNT use in Australia, specifically regarding the readiness and confidence of dietitians to make change, their attitudes and familiarity with NCP and IDNT, as well as the training and support required. The information from the USA whilst useful, was not always translatable to the Australian context due to differences in health culture and systems, such as electronic health records, and the fact that the USA had started implementation at least 5 years previously.

This lack of published research in an Australian health care setting may in part explain the lack of NCP and IDNT implementation by WA hospital dietitians. Furthermore, uptake of NCP has been inconsistent among states, potentially due to the lack of an implementation package to guide change management. The resources available to WA dietitians at the commencement of this research project in 2010 were produced by the American Dietetic Association (ADA) and included web based tutorials, frequently asked questions, case studies and exemplar. These resources were not able to be accessed by non-ADA members at the time, and were not always transferable to the Australian clinical context due to different clinical systems and clinical delivery. Although the available resources could act as a guide and resource for dietitians in Australia, there was a lack of a comprehensive ‘how-to-guide’ on implementing NCP in a hospital setting that was relevant to Australian dietetic hospital departments.

The use of a business change management model to support implementation of NCP and IDNT has been identified by several authors (Academy of Nutrition and Dietetics, 2006; Atkins, Basualdo-Hammond and Hotson, 2010; Gardner-Cardani, Yonkoski & Kerestes, 2007), however, there is no known evaluation of the implementation of NCP and IDNT using any of the change management models in the literature. The gaps to implementing and using NCP and IDNT in Australian hospitals by dietitians were considered to include a lack of understanding about the current knowledge, attitudes, barriers and requirements to implement, the methodology to incorporate into their documentation processes due to the lack of evidence based approaches, and the tools appropriate to the Australian clinical context not being readily available, if at all.

1.2 AIMS AND OBJECTIVES

The research contained two distinct phases (Figure 1). Phase One was the formative research and informed the development of the NCP implementation package. Phase Two was the implementation and evaluation of the NCP package, including recommendations for future use.

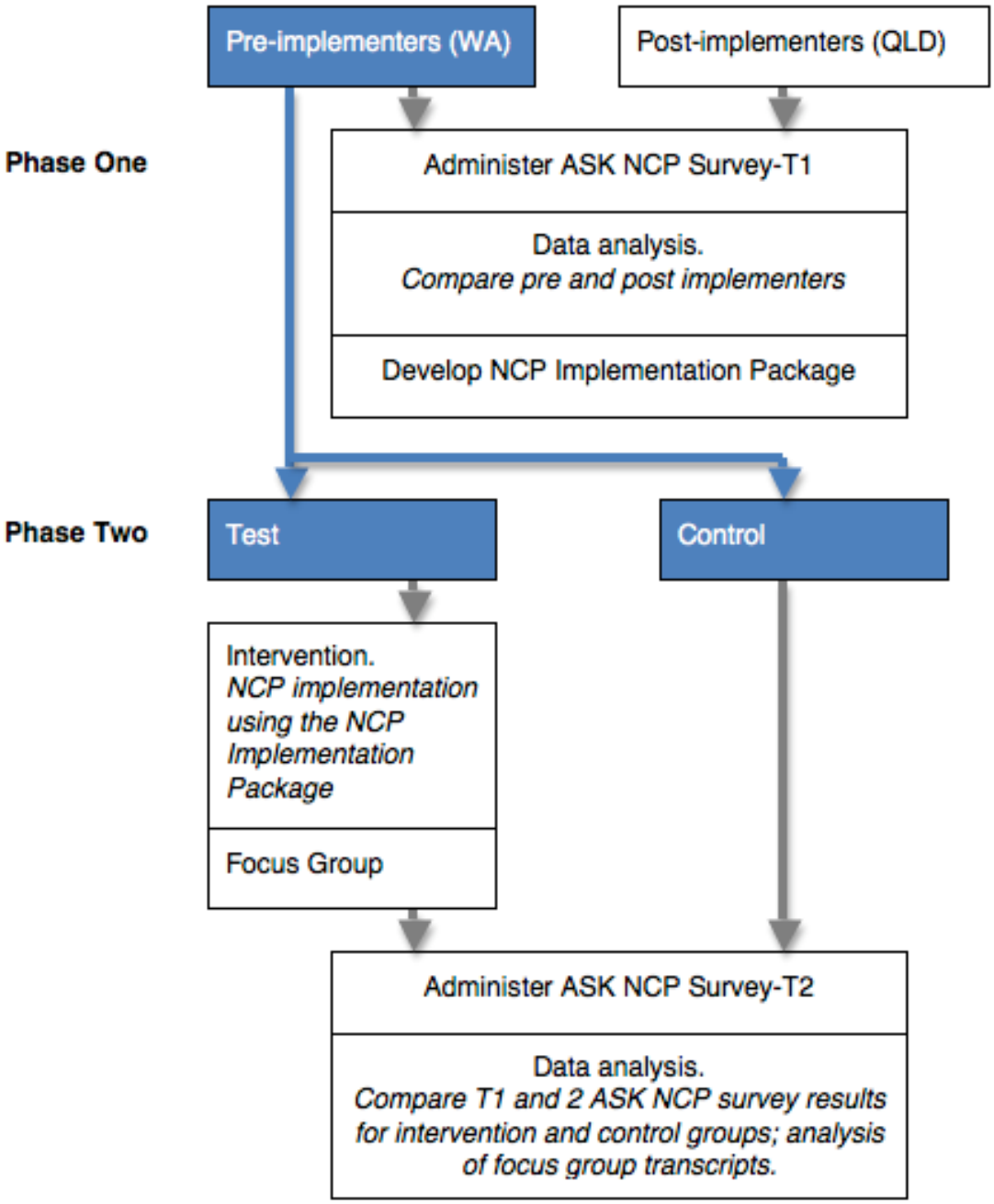

Figure 1.1: Overview of study Phases One and Two

1.2.1 Phase One: Formative Research

Aims:

- To investigate and compare the views of Australian hospital dietitians who had commenced an informal NCP implementation and dietitians who had yet to commence implementation.
- Utilise their views along with available literature to inform the development of a NCP implementation package focusing on step two of the NCP, including determination of an appropriate change management framework.

Objectives:

1a) To design, validate, administer and evaluate an online survey to evaluate dietitians knowledge, familiarity, confidence, value, barriers, support, education and training requirements regarding NCP and IDNT from participating hospitals who either had (Princess Alexandra and Royal Brisbane and Women's Hospitals in Queensland) or hadn't commenced NCP implementation (Sir Charles Gairdner Hospital, Joondalup Health Campus and Fremantle Hospital in Western Australia)

1b) To develop an NCP implementation package focusing on step two of the NCP, that utilises a business change management model

Hypotheses:

Compared to QLD hospital dietitians who have already commenced NCP and IDNT implementation

- WA hospital dietitians have a lower level of knowledge regarding NCP and IDNT.
- WA hospital dietitians have a lower level of confidence to implement NCP and IDNT.
- WA hospital dietitians require increased support, education and training to implement NCP and IDNT.

1.2.2 Phase Two: Implementation and Evaluation

Aim: To evaluate the implementation package and efficacy in three WA hospital dietetic departments.

Objectives:

2a) To introduce the NCP implementation package in two WA hospitals.

2b) To repeat the Phase One survey on WA dietitians in control and test hospitals to determine knowledge, attitude, and behaviour change post IDNT implementation.

2c) To document the WA dietitians experience of NCP and IDNT implementation within their departments via focus groups and online survey.

2d) To evaluate the package and provide recommended changes to the package.

Hypotheses:

Compared to dietitians who did not have access to the package,

- Dietitians who used the NCP implementation package significantly improved their knowledge of NCP and IDNT.
- Dietitians who used the NCP implementation package have improved confidence to implement NCP and IDNT.

1.3 SIGNIFICANCE OF THESIS

The DAA advocate for Australian dietitians to adopt the NCP and the accompanying standardised nutrition language, the IDNT. Previous studies that have examined NCP and IDNT and its use in dietetics have been limited to predominately USA and Canada.

1.3.1 Originality of Research

At the commencement of this research in 2010, there was no published Australian literature evaluating dietitians readiness, knowledge, familiarity, confidence, values, barriers, support, education and training to implement

NCP and IDNT. At this time there was limited implementation of NCP occurring in Australia with the Princess Alexandra and Royal Brisbane and Women's Hospitals in Queensland being only two of three hospitals implementing the process. These sites were nearly two years into NCP implementation and were using available literature and communication with experts in the USA. This involved three professional development sessions over three months, monthly tutorials conducted for 6 months, and then completing problem, aetiology, sign and symptom statements for review and discussion. The sites were not, however, following a formalised implementation process or evaluation (A.Vivanti, personal communication 25th April 2011).

This research is original as it has developed and validated a survey entitled Attitudes, Support and Knowledge of NCP (ASK NCP) to obtain information on knowledge, familiarity, confidence, support, values, barriers, education and training constructs regarding NCP and IDNT. The ASK NCP survey has been used to evaluate the Queensland hospital dietitians who had commenced an informal implementation process and WA hospital dietitians who had yet to commence implementation of NCP and IDNT. These data were used to inform the development of an implementation package based on a business change management model. This was then implemented in two test hospitals and evaluated against a control hospital.

1.3.2 Benefits

This research has lead to an improved understanding of how to change practice to include NCP and standardised language through an implementation methodology. Being familiar with NCP and IDNT will be an essential component of best practice dietetics management and care planning for future e-health records (O'Sullivan, Billing, & Stokes, 2011). This research contributes to best practice and adds substantially to the limited body of literature relevant to implementation of NCP and IDNT. These findings will inform recommendations on the future implementation of the NCP, training requirements and future needs of the profession. It holds relevance for dietetic professional associations, academic institutions and

dietetic practitioners, and provides recommendations and guidance for the future implementation.

Since undertaking this research, the validated survey ASK NCP has been utilised in a research project in Queensland (Vivanti et al., 2011) and by the Dietitians Association of Australia to undertake a nationwide professional survey in 2012 and 2014. It has therefore already successfully contributed the body of knowledge regarding NCP and IDNT within Australia.

1.3.3 What this thesis will do

The research focus for this project was on implementation of NCP for Australian hospital dietitians. Although IDNT exists for all stages of the NCP, this research only included the IDNT nutrition diagnosis step, as, the literature suggest an emphasis on the diagnosis step is critical as it is the least familiar for dietitians (Hakel-Smith, Lewis & Eskridge, 2005). This thesis critically reviews the literature available on NCP and IDNT as well as change management models within health practice. This thesis also describes the validation, implementation and evaluation of the survey, the implementation package and its evaluation and discusses findings in the context of current limited literature.

1.4 OVERVIEW OF THESIS CONTENTS

Chapter 1 introduces the thesis by providing an overview of NCP and IDNT, the existing gaps in current knowledge and research. It also defines the aims, objectives and hypotheses of the research, as well as the significance of the research.

Chapter 2 presents and critically reviews the background literature regarding NCP and IDNT as well as implementation and change management within the health context.

Chapter 3 presents the methodology, results and discussion of the formative research conducted in Phase One (Figure 1) of the study as a journal article

titled *Development of a Nutrition Care Process Implementation Package for Hospital Dietetic Departments* that is currently under review at the journal *Nutrition and Dietetics*.

Chapter 4 presents the methodology, results and discussion of Phase Two of the study as a journal article titled *Evaluation of a Nutrition Care Process Implementation Package in Hospital Dietetic Departments* that is currently under review at the journal *Nutrition and Dietetics.*

Chapter 5 discusses the key findings, implications of the research, limitations and future directions including research impact.

The research tools including the ASK NCP survey and consent forms are included in the Appendices.

CHAPTER 2

LITERATURE REVIEW

This chapter reviews the literature relevant to the Nutrition Care Process (NCP) and standardised language in dietetics. It provides background information and history to the development of the nutrition care process and discusses the NCP as a framework for dietetic are. Standardised terminology is considered with specific reference to the nutrition diagnosis step and explores implementation strategies including the use of change management models. A Problem, Intervention, Comparison, Outcome (PICO) search was undertaken to identify a search strategy. The keyword search was based on the research questions and included relevant electronic bibliographic databases including PubMed and Cumulative Index to Nursing and Allied Health Literature (CINAHL) The search strategy included the terms clinical dietitian or hospital dietitian, and nutrition care process or standardise language implementation, and knowledge or skill or attitude. An additional search was conducted for variation in the spelling of dietitian to accommodate American spelling being dietician. Based on the search, it was identified that this topic had insufficient evidence to conduct a systematic review and an alternative literature review was conducted. The keywords search for the literature review included terms such as standardised language, nutrition care process, nutrition diagnosis, international dietetic and nutrition terminology, nutrition and dietetics. It included searching relevant electronic bibliographic databases, targeting leading journals in the area of clinical nutrition and dietetics, and snowball technique to follow up references from the bibliography in the articles and identified in theses, textbooks, abstract, poster presentations and conference preceedings. All sources were retrieved, critically reviewed in line with the current research.

2.1 DEVELOPMENT OF NUTRITION CARE PROCESSES

In the dietetics profession, the NCP describes an organised systematic approach dietitians can use to meet the nutritional needs of individual patients (Gardner-Cardani et.al., 2007; Lacey and Cross, 2002; Lacey and Pritchett, 2003; Splett and Myers, 2001). In the development history of the NCP, various models were proposed.

2.1.1 1985-1993. The Nine-Step Nutritional Care Process (Kight)

In 1985, Kight developed a standarised language for documenting nutrition problems that dietitians were responsible for identifying and treating (Hakel-Smith et.al., 2005). This was expanded to define a nutrition care process as five steps: assess, diagnose, plan, implement and evaluate. Kight further refined the nutrition care process and in 1993, described a Nine-Step NCP guided by a three-dimension Quality Improvement Cube (QIC) (Hakel-Smith et al., 2005; Lacey and Cross, 2002; Sandrick, 2002).

Step one involved gathering evidence using the QIC, step 2 involved identification of the dietetic specific nutrition diagnosis. This was the first time the concept of a nutrition diagnosis as opposed to a medical diagnosis had been described in the literature. Step 3 identifies the etiology of the nutrition diagnosis, followed by step 4 determination of goals and step 5 nutrition interventions. Step 6 to 9 related to evaluation of critical thinking, short-term outcomes of the intervention, evaluation of long-term outcomes and tools for evaluation of nutrition care and patient outcomes. Kights Nine-Step Nutritional Care Process recognised the importance of critical thinking and placed importance on evaluation of outcomes. This was the introduction of a nutrition diagnosis and development of 74 specific and unique nutritional diagnostic categories (Lacey and Cross, 2002), however, due to the complexity of Kights process it was thought to be too theoretically based and not evaluated in practice.

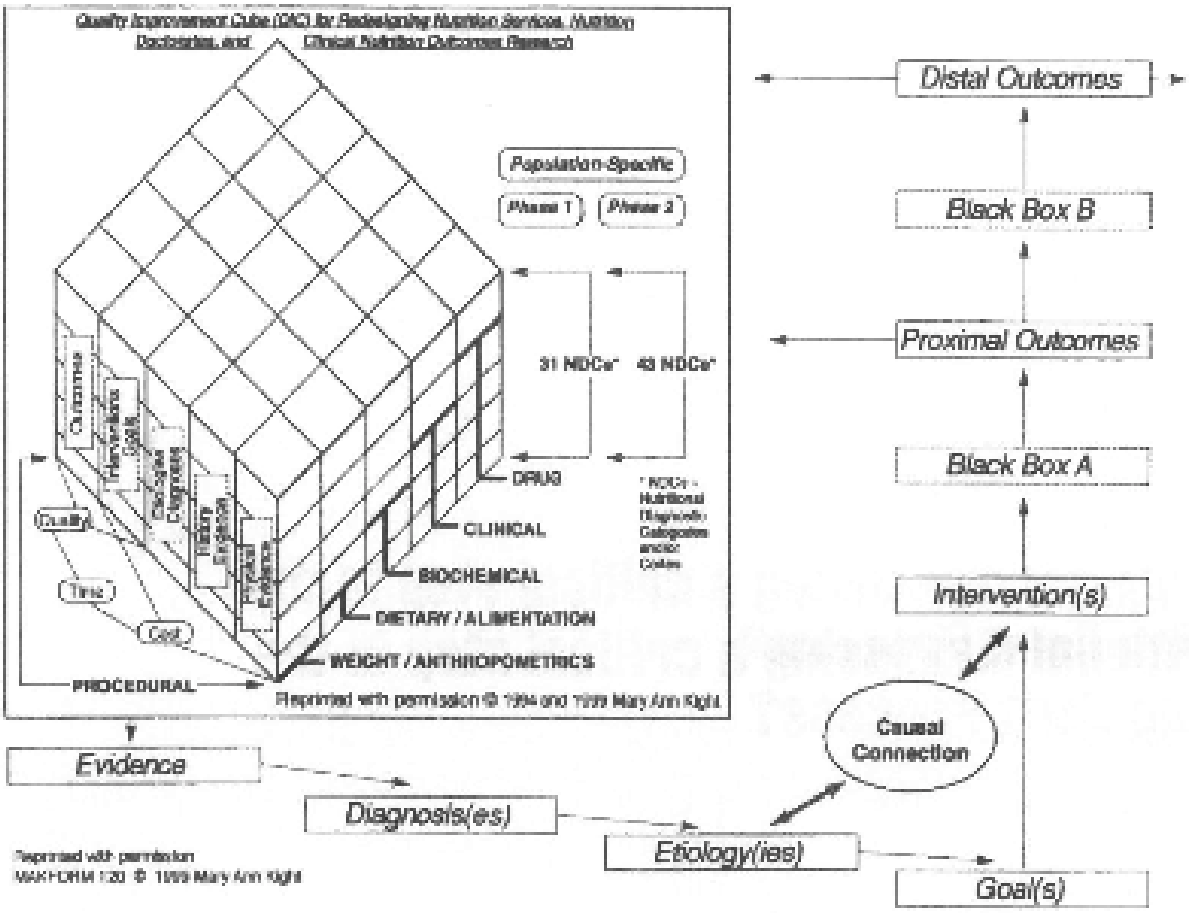

Figure 2.1: Quality Improvement Cube (Sandrick, 2002)

2.1.2 2001. Nutrition Care Model (Splett and Myers, 2001)

In 2001, Splett and Myers proposed a nutrition care model as a framework for nutrition care that could lead to standard definitions and uniform documentation of nutrition care services (Hakel-Smith and Lewis, 2004; Sandrick, 2002; Splett and Myers, 2001). This model assumed nutrition care was a component of the patient's comprehensive health care, and was coordinated with other providers in the same or other institutions (Splett and Myers, 2001).

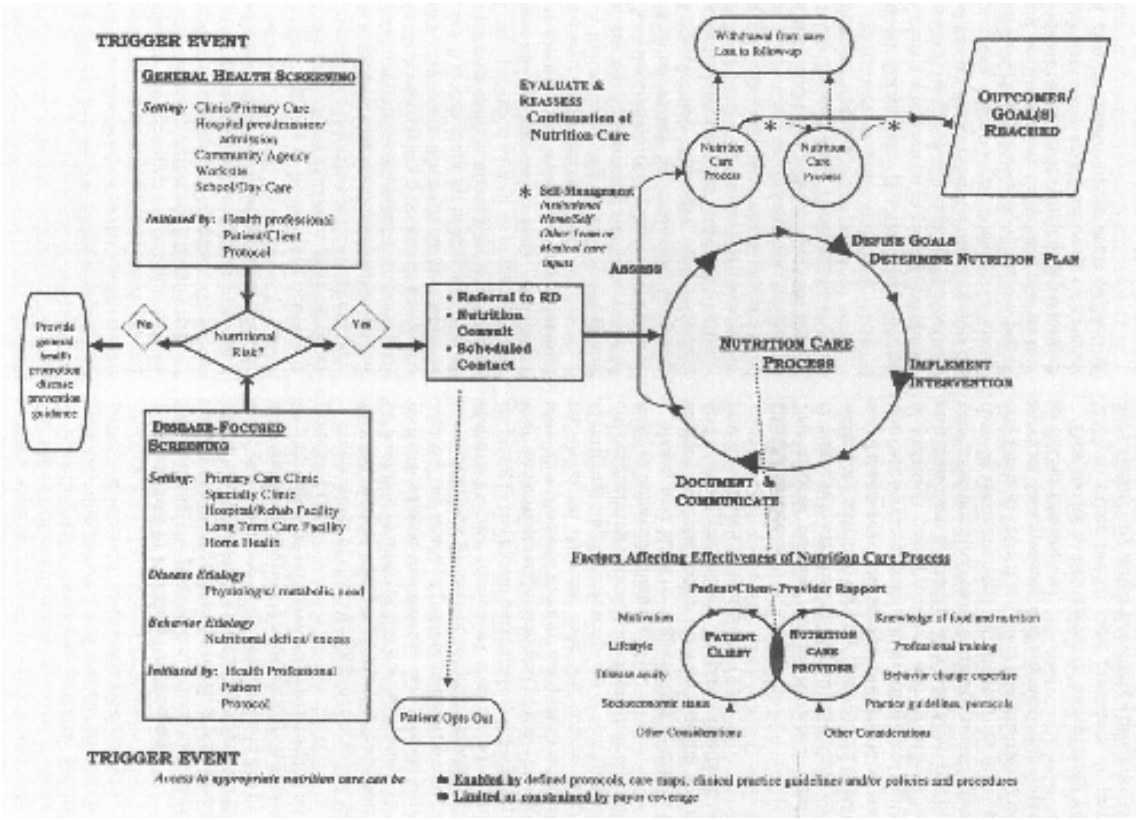

Figure 2.2 Nutrition Care Model (Splett and Myers, 2001)

The model comprised of three components:

1) A trigger event that identified whether the patient required nutrition care;
2) A nutrition care process with five essential steps – assess, establish goals and determine nutrition plan, implement intervention, document and communicate, evaluate and reassess;

3) Nutrition related outcomes which listed the most likely areas to observe results produced by or influenced by nutrition care and has four categories –patient centered outcomes, direct nutrition outcomes, clinical and health outcomes, health care utilisation/cost saving outcome (Lacey and Cross, 2002; Sandrick, 2002; Splett and Myers, 2001).

Splett and Myers' model focused on the results of nutrition care and evaluation of nutrition related outcomes, however, did not define a nutrition diagnosis as Kights model did.

2.1.3 2002. Problem based nutrition care model (Lacey and Cross, 2002)

Lacey and Cross (2002), developed a nutrition care process that combined the two previously mentioned models by incorporating both outcomes and nutritional diagnosis. The nine-step model included:

1) Assessment using problem based focused NCP;
2) Identified nutrition problems/diagnosis;
3) Identified cause;
4) Described signs and symptoms;
5) Defined outcome;
6) Intervention;
7) Documentation;
8) Evaluation of short term and intermediate outcomes; and
9) Evaluation long-term outcomes.

In addition to the NCP, Lacey and Cross (2002) recommended that nutrition care documentation follow a Problem, Intervention and Evaluation or Diagnosis, Assessment and Recommendation format. This model was incorporated into teaching and practice in the USA and provided a structure for organised thought processes during provision of nutrition care, however, was not endorsed as standardised practice thus not uniformly used. This model was not incorporated into teaching and practice in Australia.

2.1.4 2003. American Dietetic Association Nutrition Care Process

In 2003 after recognising the growing need for a standardised nutrition care model in dietetics practice, education and research, the ADA adopted and published a standardised nutrition care process (American Dietetic Association, 2008a; Hakel-Smith et al., 2005; Zelig, 2011) based on previous models (Lacey and Pritchett, 2003), and began the development of a standardised language (American Dietetic Association, 2008b). It was intended that the model would replace all previous nutrition care models. Details of this model are discussed in the following section.

2.2 THE NUTRITION CARE PROCESS

The NCP is a framework for providing nutrition care across all practice settings with the goal to enhance the provision of optimal and measurable quality nutrition care (American Dietetic Association, 2008a; Zelig, 2011). The model provides dietitians with a consistent and systematic structure to critically problem solve and make decisions that address practice related problems (American Dietetic Association, 2008a; Lacey and Pritchett, 2003). The NCP is primarily used to provide nutrition care to individuals in the health care setting, but the process has applicability in a wide variety of settings including community (both individual and groups), health promotion and research (American Dietetic Association, 2008a; Lacey and Pritchett, 2003).

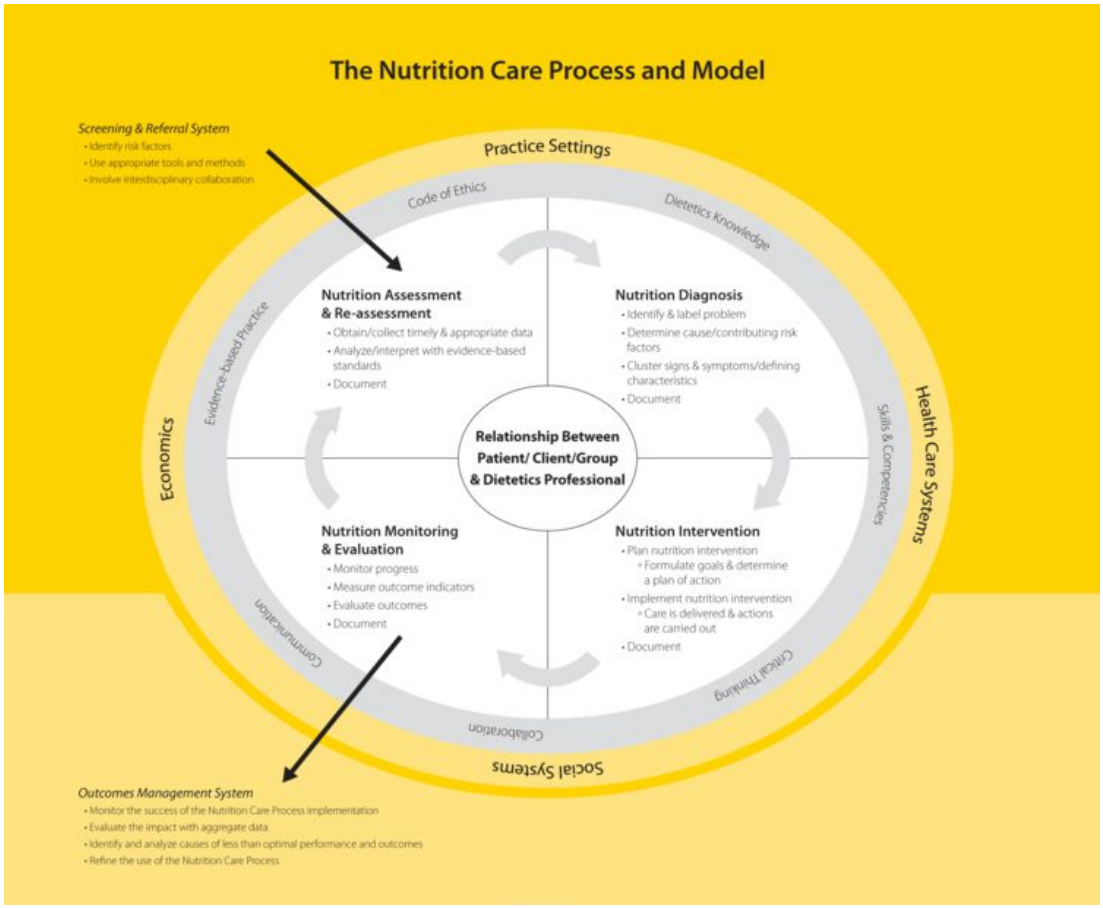

Figure 2.3. The American Dietetic Association Nutrition Care Process (Academy of Nutrition and Dietetics, 2013)

The NCP contains four distinct but interrelated and connected steps depicted in the inner circle: nutrition assessment, diagnosis, intervention, monitoring and evaluation (American Dietetic Association, 2008a). These are encompassed by the outer circle of the model that describes influences on patients nutrition care and the middle circle which describes the professional attributes of dietitians. The central core of the model depicts the essential and collaborative relationship with the patient. Nutrition assessment is the method of collecting, verifying and interpreting data needed to identify a nutrition related problem the cause and significance. Nutrition diagnosis is described in more detail in the next section and is a critical step between nutrition assessment and intervention. Nutrition intervention is aimed at the aetiology of the nutrition diagnosis and are specific actions used to treat the nutrition diagnosis. Nutrition interventions provide change related to nutrition behaviours, environmental condition or aspect of nutritional health. The last

step is nutrition monitoring and evaluation with the purpose to quantify progress made in meeting the nutrition care outcomes relevant to the nutrition diagnosis and intervention.

2.2.1 Nutrition Diagnosis

As step 2 of the process, the nutrition diagnosis, is a dietitians identification and labeling of the nutrition problem that the dietitian is responsible for treating (American Dietetic Association, 2008a). Traditionally medical diagnosis such as Type II Diabetes Mellitus, cancer or heart disease, by the medical practitioner has been the only "diagnosis" in clinical dietetic practice. This ensured consistency in medical documentation and medical care delivery. However, over the years different professions have adopted the practice for their specialty area, including nursing who first introduced a nursing diagnosis in the 1950's (Gardner, 2003). Dietitians traditionally have used the medical diagnosis as the nutrition related problem, however, this does not outline the specific problem the dietitian is addressing. For example, the medical diagnosis of Type II Diabetes Mellitus does not provide detail of the nutrition related problem the dietitian will actually target, such as excessive carbohydrate intake. The concept of a nutrition diagnosis was identified in previous nutrition care models, however, limited information on how to conduct the process was provided and the models were not endorsed or implemented as standard practice for dietitians. The inclusion of a nutrition diagnosis step as part of the NCP emphasises the connection between nutrition assessment and nutrition intervention that provides guidance for evaluation of outcomes. The nutrition diagnosis should not be confused with the medical diagnosis as the nutrition diagnosis evolves with the progress of the patient (Lacey and Pritchett, 2003). For example, a patient with a nutrition diagnosis of excessive carbohydrate intake may achieve appropriate carbohydrate intake and thus improving their blood glucose levels, however the medical diagnosis of Type II Diabetes Mellitus remains.

The nutrition diagnosis has three distinct components: the nutrition problem, the aetiology of the problem and the signs and symptoms. The nutrition problem is described by standardised terms and definitions and involves

processing data from the assessment to synthesise the nutrition diagnosis (American Dietetic Association, 2009; Kight, 1993; Lacey and Pritchett, 2003). In the inclusion of nutrition diagnosis in her model, Kight identified that it was a difficult step, as it required not only knowledge, but also application of reasoning skills.

Identification of a clear, accurate nutrition diagnosis is an essential outcome of the process and the problem should be a nutrition related problem that is treatable by dietetic practitioners. The aetiology, the root cause of the problem can be addressed by the nutrition intervention. The signs and symptoms should be measurable to indicate whether the problem has had resolution or improvement (American Dietetic Association, 2009). This Problem, (a)Etiology, Signs and Symptoms statement (PES) is included as the nutrition diagnosis. An example PES statement for a patient with a medical diagnosis of Type II Diabetes Mellitus is excessive carbohydrate related to food and nutrition knowledge deficit as evidenced by high glycated haemoglobin level and self-blood glucose monitoring charts with three daily 2 hour post-prandial blood glucose level >9mmol/L. The nutrition intervention aims to target the aeitology identified in the PES statement to have an impact and reduce the negative signs and symptoms. These signs and symptoms are then the target of what monitoring and evaluation techniques will be used. In the example above, the nutrition intervention would focus on the food and knowledge deficit, whilst the glycated haemoglobin and post-prandial blood glucose levels are monitored to see if the intervention has been effective.

2.3 STANDARDISED NUTRITION LANGUAGE

Documentation of clinical services within health care systems has become increasingly significant for the evaluation of patient care and emphasis on patient outcomes (Hakel-Smith and Lewis, 2004; Hakel-Smith et al, 2005).

Patient records are used as the primary source of information to evaluate patient care, therefore dietitians need to integrate the scientific method and a standardised language into nutrition practice to uniformly and completely document essential information to describe dietetic contributions to patient outcomes (Hakel-Smith et al, 2005). Concise and consistent documentation is not the only reason for a standardised language, with other uses including data collection and comparison, consistent communication, and identification of the nutrition problem or diagnosis.

Given the multiple users who depend on health care information in the patient record, it is imperative that dietitians adopt a standardised framework and language to document comprehensively and communicate meaningful information concerning their role in improving patient outcomes (Hakel-Smith and Lewis, 2004). The medical profession has developed a standard language, the International Classification of Diseases (ICD) to describe a patient's medical condition (World Health Organisation, 2014). In the 1960's the nursing profession adopted a common nursing process that remains central to all nursing actions and standardise nursing practice, forming the basis of documentation and continuity of care (Splett and Myers, 2001). In 1970, the nursing profession developed a standard language for nursing diagnosis that communicated patient's problems that nurses diagnose and treat, and a language for nursing interventions to document, reflect and study nursing care. These distinguish the unique body of knowledge needed for nursing practice (Hakel-Smith and Lewis, 2004; Splett and Myers, 2001). There are currently twelve standardised terminology sets that support nursing clinical practice (Duffy, et al., 2012). Of these, the Clinical Care Classification System (Saba, 2002); International Classification for Nursing Practice (Warren and Coenen, 1998); a combination of the NANDA International (NANDA International, 2011), Nursing Intervention Classification (Bulechek et al., 2008) and Nursing Outcomes Classification (Moorhead et al., (2008); the Omaha System (Martin et al., 1992); and Perioperative Nursing Data Set (Kleinbeck, 1999); include nursing diagnoses, interventions and outcomes

Uniform and complete documentation of nutrition care and outcomes by dietitians is essential to evaluate and coordinate care; demonstrate the type, level and complexity of nutrition care; and generate new knowledge on the effectiveness and outcomes of nutrition care (Hakel-Smith et al., 2005). It provides an opportunity to improve practice, support concise medical record documentation and acknowledge dietetic recommendations by primary care providers (Corado and Pascual, 2008; Lacey and Cross, 2002).

Although several standard terminologies already exist in Australia, such as the International Classification of Diseases Australian Modification (ICD-10-AM), Indicator for Intervention (IFI) for Allied Health and International Classification of Functioning, Disability and Health (ICF), these facilitate communication among healthcare professionals, but do not substitute profession specific standardised language or provide the level of detail necessary for the accurate description of medical nutrition therapy. They provide a standardised language by which to communicate and record data, however tend to be either a medical diagnosis like malnutrition, overweight, underweight or an aetiology, sign or symptom such as high blood glucose levels, as opposed to a nutrition diagnosis. They are not robust or inclusive enough, therefore, limiting the effectiveness for clinical dietitians.

2.3.1 International Dietetic and Nutrition Terminology

The concept of a standardised nutrition language was first described by Kight in 1993 to describe the nutrition diagnosis, however, it was not widely adopted into dietetic practice. The American Dietetic Association (ADA) identified a need to develop a new standardised language that uniformly documented and described nutrition care services, specified the types and amount of nutrition care provided, generated new knowledge on the effectiveness and outcomes of nutrition, facilitated reimbursement and provided data needed by policy makers to change policy (Hakel-Smith and Lewis, 2004). The adoption of a standardised language within all NCP steps allows dietitians to name a patient's health problem(s) or needs and to communicate treatment strategies and evaluate care effectively (Hakel-Smith

and Lewis, 2004). Although standardised languages in medicine and nursing can describe nutrition terms such as malnutrition or overweight, none of the terms adequately describe the breadth and depth of activities unique to the profession of dietetics (American Dietetic Association, 2008b), such as inadequate protein-energy intake, hence the requirement for the nutrition specific IDNT.

The IDNT component of the NCP was introduced in 2005 (American Dietetic Association, 2008a; American Dietetic Association, 2008b; Zelig, 2011) and was developed to describe the unique functions of dietetics in nutrition assessment, nutrition diagnosis, nutrition intervention and nutrition monitoring and evaluation (American Dietetic Association, 2008b; Zelig, 2011) and to facilitate communication among dietitians and other health care professionals (Parrott, 2012; Zelig, 2011). This led to the development diagnostic terms with definitions, etiologies and defining characteristics.

The ADA published the IDNT Reference Manual: Standardized Language for the Nutrition Care Process (Academy of Nutrition and Dietetics, 2013; American Dietetic Association, 2008; American Dietetic Association 2009; American Dietetic Association 2011) as a reference guide for dietitians. The IDNT was published annually for the first five years and biannually up to 2014. It is now published online and is continually revised based on validation studies, ongoing research, and feedback from dietetic professionals internationally (American Dietetic Association, 2008b). The current IDNT Reference Manual Fourth Edition (Academy of Nutrition and Dietetics, 2013) is available online and includes more then 500 terms describing all four steps of the NCP.

The IDNT has been shown to improve communication of the nutrition problem. When comparing dietetic documentation for evidence of the NCP, Hakel-Smith et al (2005) found that the focus of NCP was clearer when a standardised language was used to document and communicate the nutrition problem, etiology and subsequent nutrition diagnosis to other members of the health care team. They concluded that use of the language across

institutions could gather outcome data to evaluate effectiveness of dietetic practice and intervention and generate a new body of knowledge on the effectiveness of nutrition care (Hakel-Smith et al., 2005).

2.4 NUTRITION CARE PROCESS IN CLINICAL HOSPITAL PRACTICE

Since its conception, the NCP has been implemented in dietetics practice and education in the USA and expanded to other countries including Australasia. There is however, limited research on implementation of it into clinical hospital practice. An extensive search in 2010, 2013 and 2014 of the Pubmed database and Google Scholar using the following key words; nutrition care process, standardised language, IDNT, NCP, implementation, which yielded a total of 18 papers and abstracts. Eleven published papers and abstracts investigated NCP and IDNT use within the clinical hospital setting (Desroches et al., 2014; Gardner-Cardani et al, 2007; Hakel-Smith et al., 2005; Kim and Baek, 2013; Mathieu, Foust & Ouelette, 2005; Mueller, et al., 2008; Parrott, 2012; Roberts and Shiner 2009; Rossi et al., 2014; Van Heukelom et al., 2011; Zelig, 2011), whilst seven reported on the theoretical model and benefits (American Dietetic Association, 2008a; American Dietetic Association, 2008b; Hakel-Smith and Lewis, 2004; Kieselhorst et al., 2005; Ritter-Gooder and Lewis, 2010; Sandrick, 2002; Splett and Myers, 2001). Findings from these studies are described in the following sections.

2.4.1 Benefits of NCP and IDNT

The benefits of NCP and IDNT documentation for both the profession and patients has been consistently reported. These include:

- Provision of a method for documenting the scientific logic of nutrition care and its outcomes (American Dietetic Association, 2008b; Hakel-Smith et.al., 2005)
- Focus for nutrition practice and clinical dietetics unique body of knowledge (Hakel-Smith and Lewis, 2004; Hakel-Smith et.al., 2005);
- Comparison of measurable outcomes of nutrition therapy (Hakel-Smith and Lewis, 2004; Hakel-Smith et.al., 2005; Lacey and Pritchett, 2003; Mathieu et.al, 2005);
- Communication of a language that describes nutrition problems, communicates with the health care team and enhances patient safety through continuity of care (Hakel-Smith and Lewis, 2004; Hakel-Smith et.al., 2005);

- The basis for dietetic reporting in electronic health records (American Dietetic Association, 2008b; Hakel-Smith and Lewis, 2004);
- Increased productivity of 30% in clinical practice (Corado and Pascual, 2008);
- Improved acknowledgement of dietetic recommendations by primary care providers (Corado and Pascual, 2008)

In addition to these benefits, documenting the NCP has been reported to improve the quality of dietetic documentation by reducing extraneous language and being more concise (Mathieu et al., 2005), improving clarity regarding the dietetic assessment, clearly specifying the nutrition problem and then the direct intervention and monitoring processes to impact that nutrition problem. However, there is a gap in the evidence regarding the impact of this quality improvement, and also the accuracy and quality of documenting the NCP, specifically the nutrition diagnosis.

2.4.2 Barriers and Drivers

Due to a paucity of studies relating to NCP and IDNT implementation in dietetics practice, professional experience of implementation and the reference to implementation studies in other professions such as nursing is worthy of investigation. Common barriers and drivers to uptake have been identified in both the dietetic and nursing research on the implementation of standardised language (Higuchi et al, 1999; Paganin et al, 2008; Parrott, 2012; Stocker, 2001). These should be considered when implementing NCP in Australian hospital dietetic departments and are summarized in Table 2.1:

Table 2.1: Drivers and barriers to implementation of a framework within health care

Drivers	Computer generated care plans / electronic medical record (Axelsson et al, 2006; Florin et al 2005; Higuchi et al, 1999; Muller-Staub, 2009; Paganin et al, 2008; Stocker, 2001; Thoroddsen and Ehnfors, 2007)
	Knowledge (Axelsson et al., 2006; Florin et al., 2005; Higuchi et al., 1999; Muller-Staub, 2009; Paganin et al.,2008; Stocker, 2001; Thoroddsen and Ehnfors, 2007)
	Confidence (Axelsson et al., 2006; Florin et al., 2005; Higuchi et al., 1999; Muller-Staub, 2009; Paganin et al.,2008; Stocker, 2001; Thoroddsen and Ehnfors, 2007)
	Implementation/formal education programs and educational strategies (Axelsson et al., 2006; Desroches et al., 2014; Florin et al., 2005; Higuchi et al., 1999; Muller-Staub, 2009; Paganin et al., 2008; Stocker, 2001; Thoroddsen and Ehnfors, 2007).
	Positive attitude on perceived benefit and value of standardized terminology (Axelsson et al., 2006; Florin et al., 2005; Higuchi et al., 1999; Muller-Staub, 2009; Paganin et al., 2008; Stocker, 2001; Thoroddsen and Ehnfors, 2007)
	Coach/change agent; planned work in groups (Axelsson et al., 2006; Florin et al., 2005; Higuchi et al., 1999; Muller-Staub, 2009; Paganin et al., 2008; Stocker, 2001; Thoroddsen and Ehnfors, 2007)
	Support efforts from managers and administrators (Axelsson et al., 2006; Florin et al., 2005; Higuchi et al., 1999; Muller-Staub, 2009; Paganin et al., 2008; Stocker, 2001; Thoroddsen and Ehnfors, 2007)
	Sufficient time available to implement (Parrott, 2012)
	If colleagues were already using IDNT to document patient care then this was a driver for others to implement (Parrott, 2012)
	Respondents who believe that using the IDNT reduced documentation time were more likely to use it

	(Parrott, 2012)
Barriers	Lack of motivation of staff to make the change, managers difficulty in maintaining staff morale through the change process (Mathieu et al, 2005; Paganin et al, 2008; Parrott, 2012; Van Heukelom et al., 2011)
	Lack of staff understanding of the benefit and lack of confidence and research in the benefit of the terminology (Paganin et al., 2008; Stocker, 2001)
	Lack of authority for the change to be made (Parrott, 2012)
	Lack of understanding of how to assist dietitians in changing the way they think about medical record documentation and overall lack of experience (Mathieu et al., 2005; Paganin et al., 2008)
	How to exclude extraneous language and creating statements within the documentation as new format more concise compared to the traditional conversational method of SOAP format (Mathieu et al., 2005)
	Lack of time to implement (Higuchi et al., 1999; Stocker, 2001; Zelig, 2011) workload level (Paganin et al., 2008; Van Heukelom, 2014) and impact on productivity (Roberts and Shiner, 2009)
	Lack of resources for assessment and documentation (Zelig, 2011)
	Lack of support from managers, supervisors or from outside the profession (Paganin et al., 2008; Stocker, 2001; Zelig, 2011)
	Lack of knowledge and a formal education program with practical training (Desroches, 2014; Higuchi et al., 1999; Paganin et al., 2008; Roberts and Shiner, 2009; Stocker, 2001)
	Unrealistic goals and expectations (Lee, 2005)

2.4.3 Implementation of NCP and IDNT for nutrition diagnosis in dietetic practice

Only one known published study has measured the change in knowledge and attitudes of dietitians following an education intervention on applying the NCP and IDNT to their practice setting. This was a web-based intervention conducted in the USA. Dietitians completed a pre-test survey, the course module then a repeat survey (Zelig, 2011). Results showed a significant increase in both knowledge and attitude scores from pre to post test. However, as no control group was used, it was not clear whether the change was directly related to the intervention or due to other factors such as participants accessing information from other sources such as continuing professional development events or resources.

Dietetic studies that have examined implementation of NCP and IDNT have demonstrated that provision of education and tools to dietitians is essential to successful integration of the NCP into medical record documentation and nutrition care (Van Heukelom et al., 2011; Zelig, 2011). These strategies were considered when planning the implementation package for this current research.

One of the barriers to implementation is appropriate training (Desroches et al., 2014; Hakel-Smith et al., 2005). Hakel-Smith et al., (2005) highlighted this when using IDNT. Those who were provided with training documented with NCP more frequently than those who were untrained. Desroches et al., (2014) also identified training as a facilitator to use from their survey of dietetic education, dietetic new graduates and interns. Initial training was important, as is ongoing education and clinical experience in documentation to embed the language into hospital dietetic practice (Atkins et al., 2010).

Tools and strategies reported in the literature as being effective to assist with implementation of NCP and IDNT include spending time to engage staff in the change (Gardner-Cardini et al., 2007), conducting regular in-services (Mathieu et al., 2005, Mueller et al., 2008, Roberts and Shiner, 2009; Van

Heukelom et al., 2011), case studies (Atkins et al., 2010; Mathieu et al., 2005, Roberts and Shiner, 2009), peer learning (Atkins et al., 2010; Gardner-Cardini et al., 2007; Mathieu et al., 2005; Roberts and Shiner, 2009; Van Heukelom et al., 2011), coaching group work (Atkins et al., 2010; Mathieu et al., 2005; Mueller et al., 2008; Van Heukelom et al., 2011), mentors (Atkins et al., 2010) and medical record documentation audits (Atkins et al., 2010; Gardner-Cardini et al., 2007; Mathieu et al., 2005; Van Heukelom et al., 2011). These factors should therefore be considered when implementing NCP.

2.5 ORGANISATIONAL CHANGE MANAGEMENT STRATEGIES

Adoption of the NCP and IDNT for nutrition diagnosis by clinical hospital dietitians can be complex as it presents a challenge to learn a new framework and language (Appleby & Tempest, 2006) and a change in practice and culture. The NCP requires dietitians to engage in critical thinking that integrates facts, informed opinions, active listening and observations (Lacey and Pritchett, 2003). For example, when identifying the nutrition diagnosis, it is important for the dietitian to find patterns and relationships among the data and make inferences regarding its impact, state the problem clearly and singularly, move judgment to be objective and factual, review the interdisciplinary connections and prioritise the importance of problems for the patient (Lacey and Pritchett, 2003). This critical thinking is essential to the successful implementation of NCP in dietetic practice and can present further challenges in adopting the NCP and IDNT for nutrition diagnosis.

Organisational change management strategies have been identified in the literature as being useful to dietetic managers to prepare and implement the NCP and support dietetic staff (Atkins et al., 2010; Gardner-Cardani et al., 2007).

Gardner-Cardani et al., (2007) utilised change management strategies for successful transition to the NCP in a hospital dietetic department. They identified that incorporation of the NCP and IDNT within their hospital

department challenged cultural norms about clinical dietetic practice and documentation and concluded that utilised organisational learning approaches and change management principles were helpful in promoting a successful transition. This was supported by Atkins et al., (2010) who recommended implementation should be based on organisational change management principles on discussing implementation from a Canadian perspective.

It was difficult to identify a consensus regarding a framework for organisational change management as there is not one widely accepted, clear and practical approach that explains what changes organisations need to make and how to implement (Rune Todnem, 2005). The planned approach to organisational change attempts to explain the processes that bring about change and was initiated in 1946 by Lewin. Lewin's model aimed at changing the behaviors of groups and involves actions initiated in phases over time (Erwin, 2009). Extensions of Lewin's theory include Lippitt who identified seven phases of planned change, Havelock who identified six phases of change (Lehman, 2008) and Rogers whose diffusion theory has five phases (Lorna, 2010). Lewin's theory was expanded to organisational levels by Judson 1991, Burke and Litmwin 1992, Kotter 1996, Armenakis, Harris and Field 1999 and Schein 2004 (Erwin, 2009).

Lewin's theory (Bozak, 2003; Lee, 2006) and Rogers theory of diffusion (Martin et al., 2006; von Krogh and Naden, 2008) have been used in many nursing studies, however, Kotter's eight stages of change has been used in other health related disciplines. The International Classification of Functioning, Disability and Health (ICF) is a framework and classification to provide a common language for use within the multidisciplinary health team (Appleby and Tempest, 2006). Kotter's eight stages of change was used to reflect on the implementation of ICF within an occupational therapy department. The authors reflected that explicit use of a change management theory such as the eight stages of change could enable a smoother journey and enhance the update in clinical practice (Appleby and Tempest, 2006).

Kotter's eight stages of change (Kotter, 1996) incorporates all the components of change required for implementation of the NCP and IDNT based on the available literature and other professional research. The dynamic nonlinear eight stages are:

1- Establish a sense of urgency
    - When urgency is low it is difficult to put together a group with enough power and credibility to guide the effort (Kotter, 1996). A sense of urgency was identified by Mathieu et al., (2005) as an important driver for change.
2- Creating a guiding coalition
    - Putting together a group with enough power to lead the change (Kotter, 1996). Mathieu et al., (2005) used a smaller group to pilot and then drive the implementation within their department
3- Developing a vision and strategy
    - Creating a vision to help direct the change effort and develop strategies for achieving that vision (Kotter, 1996)
4- Communicating the change vision
    - Communicate constantly and have the guiding coalition role model the behavior expected of the employee (Kotter, 1996)
5- Empowering broad based action
    - Getting rid of obstacles changing systems that undermine the vision, provide training for the employee (Kotter, 1996)
6- Generating short term wins
    - Short term wins provide evidence that sacrifices are worth it and regard change agents and continue to build momentum (Kotter, 1996)
7- Consolidating gains and producing more change
8- Anchoring new approaches into culture

The ADA suggested that effective application of Kotter's eight stages of change management process can enable successful implementation of the NCP and IDNT whilst minimising barriers associated with change (Academy of Nutrition and Dietetics, 2006). There are many change management models available however no consistent model is favoured in health care

implementation. Kotter's eight stages of change model (Kotter, 1996) has been successfully used in the implementation of the ICF (Appleby and Tempest, 2006) which provided evidence that it is applicable to implementation of a framework in the health care environment. The approach provides a good structure to address the drivers and barriers to implementation identified in the literature and guide the implementation process. It is therefore an appropriate change management approach to develop and evaluate a process for the implementation of NCP and IDNT in a hospital dietetics department.

2.6 CONCLUSION

The literature reviewed provides valuable information to inform implementation of NCP and the IDNT for nutrition diagnosis into the WA hospital setting. There is limited published research in the area, particularly in an Australian context. Although the benefits to the profession are clear from the literature, there is a gap in knowledge, attitudes, familiarity, concerns and training requirements for WA hospital dietitians to implement NCP and IDNT for nutrition diagnosis. Learning from theory and small studies on implementation, enablers, barriers and models for implementation can be incorporated into a change management framework to guide the process for hospital dietitians.

CHAPTER 3

Development of a Nutrition Care Process Implementation Package for Australian Hospital Dietetic Departments

Currently under second review at the journal of Nutrition and Dietetics

3.1 ABSTRACT

Aim: The American Dietetic Association (ADA) has led the development and dissemination of the Nutrition Care Process (NCP), incorporating the International Dietetic and Nutrition Terminology (IDNT) as the standardised language. This research investigates and compares the views of Australian dietitians pre and post NCP implementation, to inform development of a NCP implementation package.

Methods: Dietitians from two hospitals that had undergone informal NCP implementation (post-implementers, n=35) and three hospitals yet to implement NCP (pre-implementers, n=35) completed an online questionnaire (ASK NCP) surveying demographics, and constructs relating to knowledge, familiarity, confidence, support, value, barriers, training, and NCP education.

Results & Conclusion: Post-implementers had higher knowledge scores ($p<0.05$), were more familiar with NCP ($p<0.01$), confident to implement ($p<0.01$) and supported to use NCP ($p<0.01$) than pre-implementers. Lack of knowledge, support, training and resources were identified as barriers by pre-implementers. Busy workloads and work status were identified as barriers by post-implementers. Pre-implementers felt they had insufficient NCP training, however, if further training and support were to be provided, almost all reported they would be more confident to implement. Keys to successful implementation included allocated time to practice and regular tutorials; support and leadership from their management and NCP department leader; and professional growth through understanding how change could benefit practice. The results of the study were used to inform the development of a NCP implementation package. Kotter's eight stages of change were identified as the most appropriate change management model with the framework incorporated into the package development.

Keywords: Nutrition Care Process, International Dietetics and Nutrition Terminology, stages of change, implementation, hospital

3.2 INTRODUCTION

The American Dietetic Association (ADA) has led the development and implementation of the Nutrition Care Process (NCP), a framework for dietetics care which incorporates a standardised language known as the International Dietetic and Nutrition Terminology (IDNT) (American Dietetic Association, 2008a; Hakel-Smith and Lewis, 2004; Hakel-Smith et al., 2005; Mathieu et al., 2005; Ritter-Gooder and Lewis, 2010). The NCP framework has many applications within nutrition and dietetic practice. There are four distinct components of the NCP being assessment, diagnosis, intervention, monitoring and evaluation. Nutrition diagnosis is unique to the framework and a new concept in dietetics. For hospital dietitians, utilisation of the NCP framework with the associated IDNT provides a clear nutrition diagnosis as opposed to the medical diagnosis, based on the assessment undertaken, evidenced dietetic intervention, monitoring and evaluation of nutrition care. For example, a medical diagnosis for a patient with diabetes could be Type II Diabetes Mellitus, whereas the specific nutrition diagnosis, the problem that the dietitian is directly addressing maybe excessive carbohydrate intake. The benefits of NCP and IDNT adoption for both the profession and patients include that it: ensures consistency amongst the profession; provision of a method of documenting the scientific logic of nutrition care and its outcomes (American Dietetic Association, 2008b; Hakel-Smith et al., 2005; Mathieu et al., 2005; Ritter-Gooder and Lewis, 2010); ability to compare of measurable outcomes of nutrition care (Hakel-Smith and Lewis, 2004; Hakel-Smith et al., 2005; Lacey and Pritchett, 2003; Mathieu et al., 2005); is the basis for dietetic reporting in electronic health records (American Dietetic Association, 2008b; Hakel-Smith and Lewis, 2004); improved acknowledgement of dietetic recommendations by primary care providers (Corado and Pascual , 2008); and increased productivity in clinical practice (Corado and Pascual , 2008). For the purpose of this paper, from here on, NCP also incorporates IDNT.

In 2009, the Dietitians Association of Australia endorsed the use of NCP as a model of care for Australian dietitians, and in 2010, the NCP was adopted

into the DAA National Competency Standards for Entry Level Dietitians (Dietitians Association of Australia, 2010). Despite these recommendations, in 2010 prior to this study, NCP was not used as the standard nutrition care framework in Australian hospital dietetic departments.

It is important for Australian dietitians to move forward and adopt, implement and embed NCP to align with and lead international practice. Currently the majority of the published research regarding knowledge and application of NCP to hospital dietetic practice is from America (Gardner-Cardani et al, 2007; Hakel-Smith et al, 2005; Mathieu et al, 2005; Mueller et al, 2008; Parrot et al, 2012; Roberts and Shiner, 2009; Zelig et al, 2011) and Canada (Desroches et al, 2014; Van Heukelom et al 2011). There continues to be a gap in the knowledge regarding NCP use in Australia, specifically regarding the readiness and confidence of dietitians to make change, their attitudes and familiarity with NCP and IDNT, as well as the training and support required. This formative research aims (1) to investigate and compare the views of Australian hospital dietitians who had commenced an informal NCP implementation, and dietitians who had yet to commence implementation, and (2) utilise their views, along with available literature, to inform the development of a NCP implementation package including determination of an appropriate change management framework.

3.3 METHODS

Participants were recruited through contact with the hospital dietetic department managers from five Australian hospitals selected by purposive sampling (Bowling, 2007). Of these five hospitals, two were from the state of Queensland and had undergone at least one year of informal NCP implementation (referred to as post-implementers), while three hospitals were from the state of Western Australia and were yet to undergo implementation (referred to as pre-implementers). The informal NCP implementation in Queensland consisted of three professional development sessions over three months, monthly tutorials for 6 months then completing nutrition diagnoses for review and discussion. The informal implementation was not based on a change management framework (A.Vivanti, personal communication 25th April 2011). Dietetic department managers provided written approval for researchers to invite hospital dietetic staff involvement. From these hospitals, 113 dietitians were invited to participate in the study and complete an online survey. Exclusion criteria were not applied to the cohort. Informed consent was obtained from each participant prior to completing the survey. The Edith Cowan University Human Research Ethics Committee approved the study.

The 58-item Attitudes, Support, Knowledge NCP (ASK NCP) survey contained multiple choice, Likert scale and open-ended questions to ascertain staff demographics and information on knowledge, familiarity, confidence, support, value, barriers, training and education constructs regarding NCP and IDNT. Knowledge questions were obtained from the ADA NCP tutorial questions (Cadden et al, 2010), and construct questions were obtained with permission from an Alberta Health Services Canada survey (C Basualdo-Hammond, personal communication 12 Oct 2010). Additional questions for the pre-implementers included their preparedness, training and support, resources required, and concerns. For post-implementers additional questions assessed their experience including challenges, tools/resources and key elements to success.

The ASK NCP survey was assessed for face and content validity by the researchers and key experts. Internal consistency and test re-test reliability were undertaken for the multiple choice knowledge questions and 5-point Likert construct questions. The ASK NCP survey was distributed to a convenience sample of 15 dietitians and re-administered to the same sample no more than five days later to minimise any potential interference from external factors. The dietitians did not participate in professional development on NCP during this period. Likert scale questions were assessed on the pilot survey for reliability using Cronbach's alpha with α>0.70 (Tabacknick and Fidell, 2001) deemed as reliable. Three questions were negatively worded and recoded. Constructs of familiarity, value, confidence, barriers, and training were reliable. Responses for repeated knowledge questions were reliable using chi-square analysis, with the exception of two questions. This was likely due to participants guessing responses based on a lack of knowledge and therefore they were not altered and no subsequent changes to the ASK NCP survey were made based on the reliability testing.

The ASK NCP survey was administered to participants by individualised emails provided by the dietetic department managers. Participants completed the online ASK NCP survey using Qualtrics version 27661 2011 (Qualtrics Labs Inc, Provo, Utah, USA) with weekly reminder emails sent over a four week period.

Anonymous quantitative data was double entered by the lead researcher, and analysed using Predictive Analytics Software (PASW) for Windows, version 18.0 2009 (SPSS Inc., IBM, Chicago, IL, USA). To compare pre and post implementers, descriptive statistics and chi square tests were completed for all demographic data, knowledge questions and Likert questions. Independent samples t-test was used for normally distributed data. Mann-Whitney U test was used for data not normally distributed. An alpha level of <0.05 was deemed significant. Anonymous open-ended responses were collated and manually analysed by the lead researcher for

recurring keywords and phrases based on the analyses. They were grouped into themes then reviewed and validated by two of the authors.
The results of the survey were used in conjunction with a literature review to choose a business change model to use as a framework for the NCP implementation package.

3.4 RESULTS

Seventy dietitians completed the survey (n=70/113, 62% response rate), distributed evenly between the pre and post-implementation groups (Table 3.1).

Table 3.1: Demographic description of the pre and post implementation participants who completed the 58-item online survey regarding NCP and IDNT.

	Post-implementers (n=35)	Pre-implementers (n=35)	Total (n=70)
Gender			
Male	0	1 (1.4%)	1 (1.4%)
Female	35 (50%)	34 (48.6%)	69 (98.6%)
Work status			
Fulltime	20 (28.6%)	20 (28.6%)	40 (57.1%)
Part time	5 (7.1%)	8 (11.4%)	13 (18.6%)
Casual	10 (14.3%)	7 (10.0%)	17 (24.3%)
Years as dietitian			
1-5	18 (25.7%)	15 (21.4%)	33 (47.1%)
6-10	12 (17.1%)	8 (11.4%)	20 (28.6%)
>11	5 (7,1%)	12 (17.1%)	17 (24.3%)

One dietitian did not respond to the value construct (n=69) and three did not respond to questions relating to support and concern constructs (n=67).
Most respondents were female (98.6%), worked full time (57.1%) and had been practicing as a dietitian for up to five years (47.1%).

Table 3.2: Pre-implementer (n=35) and post-implementer (n=35) responses to the constructs within the ASK NCP survey.

	Mann Whitney U Test		
	Mean rank[b]		p
	Pre-implementer	Post-implementer	
Total knowledge score[a]	24.15	34.01	0.27
Familiarity[b]			
Total familiarity score[c]	21.88	41.20	<0.001
I am familiar with the NCP[e]	43.33	27.67	<0.001
I am familiar with the IDNT[e]	44.56	26.44	<0.001
I am aware of the DAA[f] recommendation to adopt the NCP in Australia[e]	40.64	30.36	0.015
Value[b]			
Total value score[c]	32.39	37.69	0.269
The NCP and standarised language are applicable to my area of practice[e]	38.3	31.6	0.105
I see value of the NCP in my clinical practice[e]	36.37	33.59	0.510
I see minimal benefit in changing my clinical documentation practice to incorporate the NCP	38.30	31.60	0.109
I see the value of IDNT within my clinical practice[e]	34.34	35.68	0.752
I see minimal benefit in changing my clinical documentation practice to incorporate IDNT	37.03	32.91	0.339
I do not feel the need to change my practice	37.34	32.59	0.261
I feel isolated from knowledgeable colleagues with whom to discuss NCP/IDNT	25.83	44.44	<0.001
I feel incorporating the NCP/IDNT will improve patient care[e]	36.23	33.74	0.550
Confidence[d]			
Total confidence score[c]	23.91	45.73	<0.001
How confident do you feel to implement NCP into your own practice[e]	44.44	23.95	<0.001
How confident do you feel to implement IDNT into your own practice[e]	42.31	26.21	<0.001
How confident do you feel about identifying the most appropriate nutrition diagnosis[e]	40.49	28.15	0.002
How confident do you feel in writing PES statements[e]	41.04	27.56	0.001

Support[b]			
Total support score[c]	21.79	46.58	<0.001
Implementing the NCP /IDNT within my own practice is important to me[e]	34.37	33.62	0.852
Information on NCP/IDNT is readily available[e]	41.87	25.89	<0.001
The implications of incorporating NCP /IDNT into practice is not clear	27.15	41.06	0.002
There is support at my workplace to implement NCP/IDNT [e]	40.90	26.89	0.001
I have access to IDNT /NCP mentors[e]	45.25	22.41	<0.001
Management is supportive of implementing NCP/IDNT[e]	43.32	24.39	<0.001
My coworkers are supportive of using NCP/IDNT[e]	36.44	31.48	0.251
There is insufficient time on the job to implement new ideas such as NCP/IDNT	29.53	38.61	0.041
Concerns[b]			
Total concern score[c]	33.19	34.83	0.729
NCP/IDNT interferes with my professional autonomy	32.44	35.61	0.442
Generally I would prefer to continue my routine rather than change	35.03	32.94	0.587
I don't have time to use NCP /IDNT	32.38	35.67	0.431
Incorporating NCP/IDNT into my current practice will be inconvenient	32.91	35.12	0.622
Training[b]			
Total training score[c]	44.76	22.91	<0.001
I have had sufficient training to feel knowledgeable about the NCP/IDNT	43.99	23.71	<0.001
I have had sufficient training to feel comfortable implementing NCP/IDNT into my practice	44.72	22.95	<0.001
I require additional training specific to my area of practice[e]	26.49	41.74	<0.001

[a] Multiple choice, [b] 5 point Likert scale (strongly agree (1) to strongly disagree (5)), [c] Total corrected score,[d] 4 point Likert scale (very confident (1) to not confident (4)) [e] recoded Likert scale (strongly disagree (1) to strongly agree (5)

ASK NCP = Attitudes, Support, Knowledge Nutrition Care Process Survey, NCP = Nutrition Care Process

IDNT = International Dietetics and Nutrition Terminology, PES = Problem, etiology, signs and symptoms

3.4.1 Knowledge, familiarity, confidence

Knowledge questions were correctly answered by 13% of participants (Table 3.2). Overall, post-implementers had higher knowledge scores, were more familiar with NCP and more confident to implement than pre-implementers. Of the pre-implementers, 55% felt prepared to commence implementation.

3.4.2 Value

Participants valued NCP and IDNT similarly, however, pre-implementers felt more isolated from knowledgeable colleagues (Table 3.2). Overall, 96% of participants agreed that NCP and IDNT were applicable to practice; 93% and 88% agreed they valued NCP and IDNT respectively; 17% and 20% agreed there was minimal benefit in changing clinical documentation to incorporate the NCP and IDNT, respectively. In total, 74% felt they needed to change their practice and 75% felt incorporating NCP and IDNT would improve patient care.

Of the pre-implementers, all respondents felt there were benefits to implementing NCP and IDNT, the most common were that NCP provides a consistent structure and framework (n=28) and that the standardised language provides a common vocabulary (n=29).

3.4.3 Support

The post-implementers felt significantly more supported to use NCP ($p \leq 0.001$) then pre-implementers (Table 3.2). Overall, 86% of participants agreed that implementing NCP was important to them, however, post-implementers felt that they had more available information, implications to implementation were clear, and they had more support, access to mentors and time to implement.

3.4.4 Concerns

There was no statistical difference between pre and post-implementers concerns to implementing NCP (Table 2). A total of 79% of all participants felt that NCP did not interfere with their professional autonomy; 84% were open to changing their routine, 48% agreed and 30% were unsure as to whether incorporating NCP into their practice would be convenient. Overall only 34% of participants thought that they did not have enough time to use NCP.

Time constraints concerned both pre (n=17) and post-implementers (n=4), with additional barriers including lack of knowledge (n=25), training and support (n=24) and resources (n=17) identified by the pre-implementers. Post implementers highlighted busy workloads, and work status as barriers, and part time/casual staff found it difficult to participate in implementation. This was supported by participant responses in the open-ended questions.

> "*an obvious barrier is my part time position, which is only clinical load and doesn't include any training time" (Participant 46)*

Pre-implementers were concerned that implementing NCP would decrease productivity (n=16) and that they would have difficulty determining Problem Etiology Statements (PES) (n=14). Post–implementers found the PES statements challenging (n=3) specifically for total parenteral nutrition and enteral nutrition, and in situations when there was no nutrition diagnosis.
Of the pre-implementers, 48% felt that implementation would be difficult or very difficult, and not having a clearly planned approach to the implementation was highlighted as a concern.

3.4.5 Training, Resources and Tools

Pre-implementers reported less training on NCP ($p \leq 0.001$) (Table 3.2), however, with further training and support, 97% anticipated greater confidence to implement NCP. The resources and tools that post-implementers found most useful were: reference sheets including diagnosis

definitions, frequently asked questions and PES ready reckoner (n=12); regular case studies with their peers in the form of tutorials and peer group supervision (n=9); and support from the department manager, their peers and their department IDNT leader (n=2) who was leading the implementation process. Further, pre-implementers felt that reference sheets (n=22), manuals (n=9), case studies (n=3) and policies and procedures (n=2) would facilitate the incorporation of NCP into their practice.

3.4.6 Key Elements to Successful Implementation

Key elements to successful implementation of NCP as reported by post-implementers (n=16) from open ended questions were: having resources, particularly allocated time to practice and regular tutorials (n=8); support and leadership from their management, department IDNT leader and from within their state colleagues in other hospitals (n=6); and professional growth through understanding the need for and benefits of change to practice (n=5). This was supported by responses from post-implementers including:

> *"Ensuring people are aware as to why we need to implement this and the benefits associated with this to justify its usefulness rather than simply being just another thing to do" (Participant 19)*

Post-implementers reported that improvements to implementation could be made through education and knowledge (n=2); and consistently and clearly identifying the benefits, implications and application of NCP and IDNT (n=3).

3.4.7 Determining a business change model

Themes arising from the qualitative outcomes were leadership and support, time and a structured planned approach to implementation. It is identified in the literature that business change management models are useful to dietetic managers to prepare and implement the NCP (Atkins et al, 2010; Gardner-Cardani et al, 2007). There are many change management frameworks available, however, no consistent model is favoured in health care implementation. The ADA suggest that effective application of Kotter's eight stages of change management process can enable successful

implementation of the NCP whilst minimising barriers associated with change (Academy of Nutrition and Dietetics, 2012). This model has been successfully used in the implementation of the International Classification of Functioning, Disability and Health (ICF) framework (Appleby and Tempest, 2006) providing evidence it is applicable to implementation of framework in health care.

Kotter's change model provides a good structure to address the drivers and barriers to implementation identified in this study and guide the implementation process. It was recognised after analysis of the results that a change management approach should be used to develop a NCP implementation package and Kotter's eight stages of change was most appropriate.

Kotter's approach sees organisational change managed using a dynamic, non-linear eight-step approach:

1. Establish a sense of urgency,
2. Create guiding coalition/leadership group,
3. Develop a vision and strategy,
4. Communicate the change vision,
5. Empower broad based action,
6. Generate short term wins,
7. Consolidate gains and produce more change, and
8. Anchor new approaches in the culture and institutionalize change (Kotter, 1996).

3.5 DISCUSSION

The aim of this study was to investigate and compare the views of Australian hospital dietitians who had undertaken an informal NCP implementation and those who had not, utilising their views to inform the development of a NCP implementation package. This was achieved with the development and validation of the ASK NCP survey. The views of the study participants indicated that post-implementers were more knowledgeable, familiar and confident with NCP suggesting that their informal implementation experience was successful in these areas. However, support, direction, training and resources to implement were identified as potential barriers and important by both pre and post-implementers. These findings are consistent with previous studies (Desroches et al 2013; Higuchi et al, 1999; Paganin et al 2008; Parrot et al, 2012; Roberts and Shiner, 2009; Stocker, 2001; Van Heukelom et al, 2011; Zelig et al, 2011).

One of the barriers to implementation is a lack of training (Desroches et al, 2014; Hakel-Smith et al, 2005) with those dietitians who are provided training utilising NCP more frequently. Our findings suggest this training has to be ongoing to embed the concepts into hospital dietetic practice (Atkins et al, 1010). This was evident as the post-implementers who had received some training on NCP were more knowledgeable and confident than pre-implementers. It is important in developing an implementation package that training is included as a continuous driver for change.

Dietetic studies that have examined implementation of NCP have demonstrated that provision of education and tools to dietitians is essential to successful integration of the NCP into medical record documentation and dietetic care (Gardner-Cardani et al, 2007; Hakel-Smith et al., 2005; Mathieu et al., 2005; Roberts and Shiner, 2009; Van Heukelom et al, 2011). These strategies and those identified in this study were considered when developing the NCP implementation package and are discussed in the following sections.

Adopting the NCP for Australian hospital dietitians is a process of change, and the study results support that a successful implementation package requires a clear, planned approach to facilitate change.

Kotter's eight stages of change were used as the framework for development of the NCP implementation package (Figure 3.1). Each stage is discussed with reference to the implementation package including how the results from the ASK NCP survey informed its development.

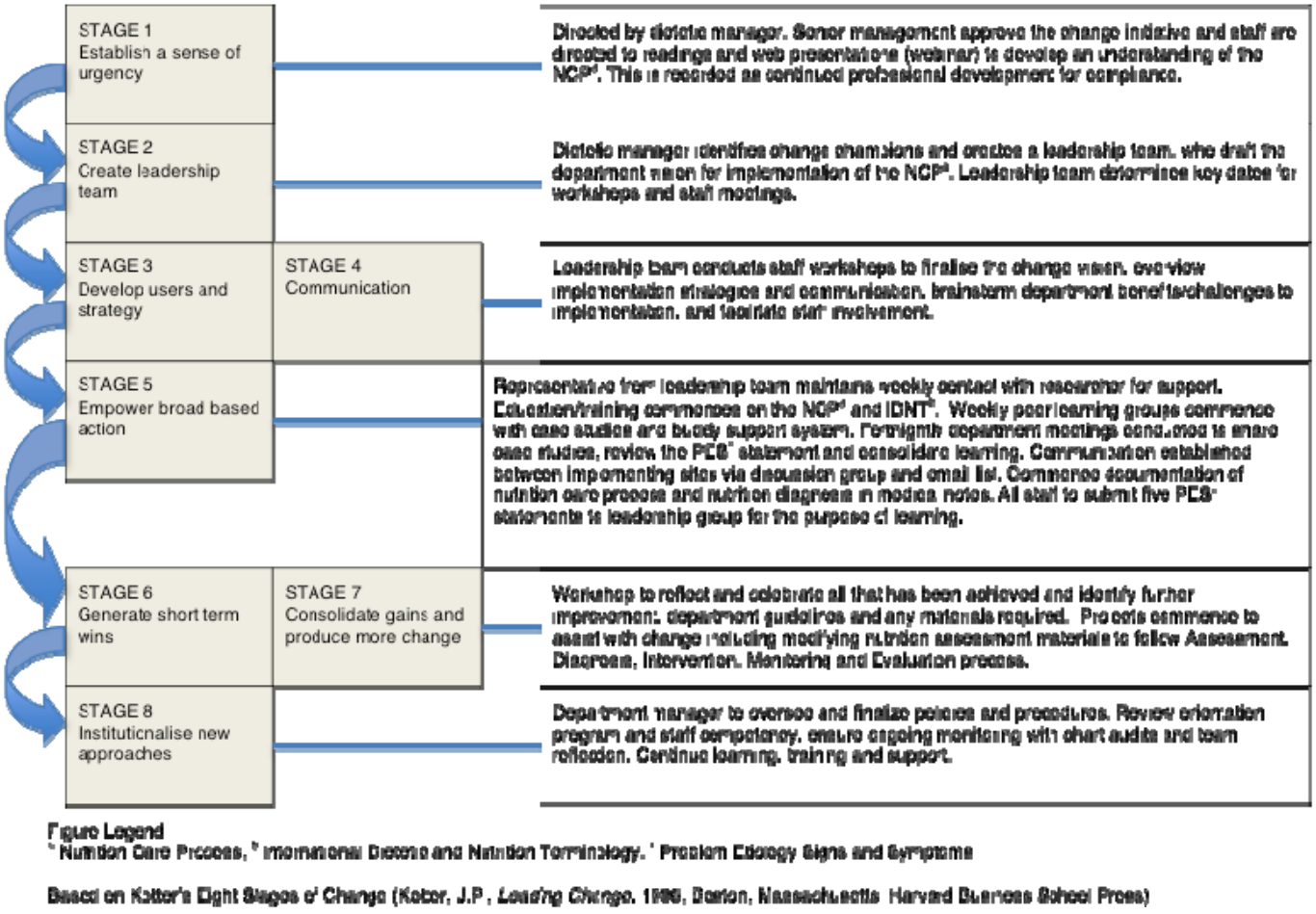

Figure 3.1 Overview of the Concepts incorporated into the NCP Implementation Package for Hospital Dietetic Departments

3.5.1 Stage 1: Establishing a sense of urgency

Our findings suggest that although Australian dietitians value the NCP, they are not familiar with the detail of the framework and its components. It is therefore important to raise awareness and understanding to generate interest and an urgency to change practice. This should be supported and driven by managers who gain organisational support and then provide support to their staff (Gardner-Cardani et al., 2007; Mathieu et al., 2005). The results suggest participants anticipated that management would be supportive and not seen as a barrier.

Time required to implement NCP was identified as a barrier by pre-implementers. As successful implementation consumes time (Erwin, 2009; Gardner-Cardani et al., 2007; Mathieu et al., 2005) and resources (Gardner-Cardani et al., 2007), it is important that managers commit adequate time to support staff to acquire knowledge, facilitate behaviour change and gain experience with the new process. Our qualitative results highlight additional challenges for part-time staff, which need to be considered during implementation.

To increase familiarity and basic understanding of the topic, it is recommended for managers to encourage staff to read supporting materials and participate in presentations on NCP. This has been incorporated into the implementation package (Figure 3.1).

3.5.2 Stage 2: Create a Leadership Team

Our study confirmed that peer support by having a NCP leader was supported by both pre and post-implementers. Creating support structures including leadership teams is an important strategy that should be created early in the change process (Parrot et al., 2012). This can provide an avenue for support and mentoring which can encourage and maintain change (Lee, 2006), and has been used successfully in implementation (Gardner-Cardani et al., 2007).

Major change is difficult to accomplish, and a force is required to sustain the process. Due to the complexity and importance of developing and communicating a vision to lead change in an organization (Kotter, 1996), a dedicated team is required to support the manager. This in itself can be a challenge to ensure that the right team is formed with enough expertise, credibility and leadership skills to drive the change process (Kotter, 1996). There are no existing recommendations in the literature as to how big the leadership team should be. We propose that for a dietetic department of approximately nine to 16 full-time equivalent staff, a team of approximately three staff representing a diverse range of expertise and clinical experience is required. For smaller departments, modification of the package to utilise technology and external peer support may be required.

3.5.3 Stage 3 and 4: Develop users and strategy; Communication

Our results found that changing behaviour was a challenge for post-implementers. Resistance to change may be due to lack of knowledge, anxiety about what changes may bring or concern about changes in work practices (Glenn, 2010). With all change management, a sense of loss and resistance can be expected (Welford, 2006). To reduce resistance and motivate staff, a vision created and adopted by the dietetic department on an individual level (see Figure 3.1) can assist by giving a clear, concise reason why they are changing (Glenn, 2010). Vision refers to a picture of the ideal future with some commentary on why people should strive to create that future (Kotter, 1996). A good vision clarifies the change direction particularly for those who may disagree or are confused as to whether significant change is necessary; provides motivation for action; and helps align individuals (Kotter, 1996). Repeating the vision is essential so that all staff remember it. To do this, the package involves embedding the vision in the department's implementation process and communicated at opportunities such as presentations, education sessions, and with written information.

3.5.4 Stage 5: Empower broad based action

Pre-implementers reported a need for training to feel confident in implementing NCP. In line with previous studies (Mathieu et al., 2005), the participants identified challenges such as documenting PES statements,

identifying nutrition diagnosis and completing documentation when no nutrition diagnosis existed. The process for this stage therefore focuses on knowledge and skill acquisition through training and aims to remove as many barriers to implementation of the change as possible (Appleby and Tempest, 2006). Knowledge acquisition does not necessarily lead to changed behaviour, therefore training should be planned (Gardner-Cardani et al., 2007; Mathieu et al., 2005). It can be a common mistake to provide insufficient or incorrect training. Dietitians should not be expected to change work habits built up over years with only a few hours or days of education. As only 13% of dietitians (including post-implementers) correctly identified all nine knowledge questions, it is likely that training needs to be ongoing to fully integrate the language into hospital dietetics documentation (Gardner-Cardani et al., 2007). It is important for managers and the leadership team to support ongoing education and training (Kotter, 1996).

Education and training can take many forms. Our results suggest real life case studies, regular peer tutorials, development of manuals and reference sheets, and support was useful in this stage of the implementation process (Figure 3.1). Mandatory participation in the training ensures that the department is moving together and staff can discuss and support each other (Gardner-Cardani et al., 2007). The peer groups and case study work are conducted prior to documenting in the medical record to assist staff gain confidence and reduce the barriers of decreased productivity.

3.5.5 Stage 6 and 7: Generate short-term wins; Consolidate gains and produce more change

As major change does take time, people who are resistant to change often require convincing evidence that all the effort is warranted and achieves relevant outcomes (Kotter, 1996). For stage 6 the leadership team and manager create a reflection and celebration opportunity, to provide evidence that sacrifices are worth it; reward change agents to build morale and motivation; help fine tune vision and strategies; and continue momentum (Kotter, 1996) (Figure 3.1). The leadership team can use the credibility afforded by the short term wins (for example audit results, peer group

reflections) to tackle additional projects and staff can take on further leadership and manage these projects (Kotter, 1996) so that change becomes permanently embedded within the departments organisational culture.

3.5.6 Stage 8: Institutionalise new approaches

It is envisaged that NCP would be incorporated into department policy for dietetic care including medical record documentation. Auditing as part of the department quality assurance cycle is important in this stage, as it can improve the quality of health care provision, raise the standard of working practices, and facilitate a cost effective use of resources (Figure 1) (Welford, 2006).

3.6 CONCLUSION

Strengths of this study included the participants being from two distinct groups (pre and post implementation) separated by geography, collection of both quantitative and qualitative data to inform package development, and the relatively good response rate of 62%[31-33] to the online survey. An important limitation of the study was the sample size, which was limited by the number of hospitals in Australia that had undergone any level of NCP implementation. The sample is not representative of the population of Australian hospital dietitians as the sample was purposive and too small to draw comparison. Non-responses could have been a result of staff absences or not wanting to participate in the study. Further, dietetic managers were not identified in the survey to differentiate their views from those of their staff. Greater exploration of the experiences of dietetic managers, given their critical role in supporting and driving the process, would be useful in future studies.

The results of this formative research study provide valuable information on the attitudes, support and knowledge of Australian hospital dietitians regarding the NCP and IDNT, and can inform department implementation. Kotter's eight stages of change as the framework forms the basis for a NCP

implementation package that will be implemented and evaluated as the next phase of this study. The next stage will investigate whether the package can significantly improve dietitians' attitudes, support and knowledge and assist in the in the adoption of NCP and IDNT in Australian hospital dietetic departments.

CHAPTER 4

EVALUATION OF A NUTRITION CARE PROCESS IMPLEMENTATION PACKAGE IN AUSTRALIAN HOSPITAL DIETETIC DEPARTMENTS

Currently under second review at the journal of Nutrition and Dietetics

4.1 ABSTRACT

Aim: Incorporation of the Nutrition Care Process (NCP) and International Dietetic and Nutrition Terminology (IDNT) into clinical dietetic practice is advocated in Australia, however, no evidence based implementation process exists, which may hinder uptake. Based on formative research findings from the ASK NCP survey and using a change management framework, we developed an implementation package for Australian hospital dietitians. This paper aims to report on the outcome of the pilot evaluation and efficacy of the package.

Method: Dietitians from three hospitals (two test and one control) in Western Australia who had not undergone NCP implementation were recruited. Evaluation occurred through administering the ASK NCP survey pre and post-implementation in all subjects, and focus groups at test sites. The Mann-Whitney U test was applied to determine whether the changes in the test group were significantly different to the control group. The Wilcoxon Signed Rank test was used to determine whether there were significant changes within groups. Focus groups were audio recorded, transcribed then analysed for themes by the authors.

Results and Conclusion: Compared to pre-implementation, the dietitians from the test hospitals had significantly higher NCP knowledge ($p=0.006$), were more familiar with NCP ($p=0.01$) and IDNT ($p=0.025$) and more confident to utilise NCP practice ($p=0.011$). Although the control group also displayed significantly higher familiarity with NCP and IDNT ($p=0.041$), significant improvements in other constructs were not observed. There was no significant difference observed between groups for all constructs likely due to small study numbers. Dietitians found the package useful, and would recommend it to Australian hospital dietetic departments.

Keywords: Nutrition Care Process, International Dietetics and Nutrition Terminology, change process, implementation, hospital

4.2 INTRODUCTION

The Nutrition Care Process (NCP) is a framework for dietetics care that incorporates standardised terminology known as the International Dietetic and Nutrition Terminology (IDNT). It is a systematic problem solving method to address practice related problems and to improve consistency and quality of care (American Dietetic Association, 2008a). Although the Dietitians Association of Australia (DAA) recommends the use of NCP, and it is incorporated into the DAA National Competency Standards for Entry Level Dietitians (Dietitians Association of Australia, 2010), in practice an evaluated implementation package is not available, and this may limit uptake.

The benefits of NCP and IDNT to dietetics practice are evident (Corado and Pascual, 2008; Hakel-Smith and Lewis, 2004; Hakel-Smith et al., 2005; Lacey and Pritchett, 2003; Mathieu et al., 2005). It is important for Australian dietitians to embrace, implement and embed NCP to align with international practice, to improve consistency of dietetic practice, to communicate and compare measurable outcomes. Implementing NCP in hospital dietetic departments is a change process. Organisational change management strategies have been identified by several authors as being useful to dietitians to prepare and implement NCP (American Dietetic Association, 2008b; Atkins et al., 2010; Gardner-Cardani et al., 2007), however, there has been no known evaluation of the implementation of NCP using any of the change management models in the literature. The gaps to implementing and using NCP in Australian hospitals by dietitians include a lack of knowledge, attitudes, barriers and requirements to implement. In addition methodology to incorporate into their documentation processes and the tools appropriate to the Australian clinical context have not been readily available.

Kotter's eight stages of change (Kotter, 1996) framework has successfully been applied to the implementation of the International Classification of Functioning, Disability and Health (Appleby and Tempest, 2006) providing evidence that it is applicable to implementation of a framework in health care. Furthermore the American Dietetic Association (Academy of Nutrition and

Dietetics, 2012) has suggested that the framework can enable successful implementation of NCP, whilst minimising barriers associated with change (Academy of Nutrition and Dietetics, 2012). The dynamic nonlinear eight stages in the framework are: 1) establish a sense of urgency; 2) create a guiding coalition; 3) develop a vision and strategy; 4) communicate the change vision; 5) empower broad based action; 6) generate short term wins; 7) consolidate gains and produce more change; 8) anchor new approaches into culture (Kotter, 1996). It provides a good structure to address the drivers and barriers to implementation and is therefore an appropriate change management approach to develop and evaluate a process for the implementation of NCP and IDNT.

Results of formative research using the Attitudes Support Knowledge NCP (ASK NCP) survey tool surveying Australian hospital dietitians identified that dietitians require more NCP knowledge, dedicated time to implement, support and training[1]. These results along with available literature informed the development of a NCP implementation package modelled on Kotter's eight stages of change (Kotter, 1996). The package comprised an overview of each of the eight stages and included a timeframe, description of components, instructions and resources (Figure 4.1).

[1] Unpublished paper 1 – Development of a Nutrition Care Process Implementation Package in Hospital Dietetic Departments.

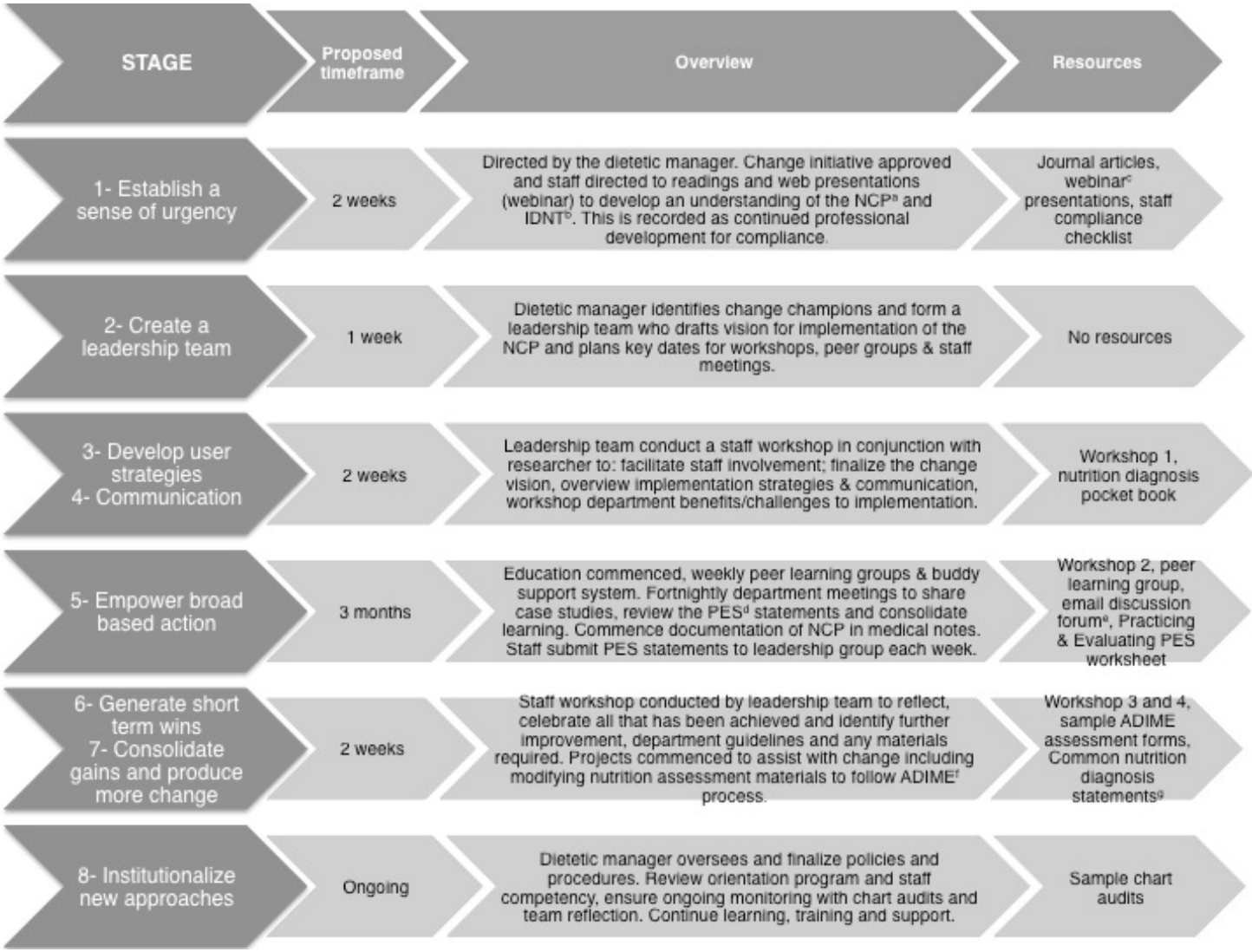

Figure 4.1 Overview of the Implementation Process for the NCP Implementation Package

The aim of this paper is to report the outcome of the pilot implementation process and efficacy of the package in two Australian hospital dietetic departments. A third hospital acted as a control group. We hypothesised that dietitians who utilised the package would significantly improve their knowledge, support, confidence and training resulting in the implementation and use of NCP and IDNT for nutrition diagnosis within medical record documentation, while dietitians who did not have access to the package would not significantly improve over the same time span.

4.3 METHODS

4.3.1 NCP Implementation Package

The implementation package was developed based on formative research results using the Ask NCP survey, of dietitians who had undergone NCP and IDNT implementation and those who had not. Figure 4.1 depicts the eight stages, timeframe, overview and resources that form the implementation package. The package included a printed manual detailing the step by step process and all resources required, and a pocket guide for nutrition diagnosis (printed with permission from the American Dietetic Association). Electronic presentations and workshop materials that focused on the NCP framework and IDNT were provided along with other resources as detailed in Figure 1. Although IDNT exists for all stages of the NCP, the implementation package focused on implementation of IDNT in the nutrition diagnosis step as this step has been identified as the least familiar for dietitians.

4.3.2 Participants

Purposive sampling was undertaken to pilot the implementation package (Bowling, 2007). Dietitians (n=35) were recruited through three West Australian hospital dietetic department managers who had participated in the formative research development stage of the implementation package but who had not undergone implementation of NCP. Of these, 24 dietitians participated in two test hospitals and 11 participated in the control hospital. Exclusion criteria were not applied to the cohort. The Edith Cowan University

Human Research Ethics approved the study and informed consent was obtained from participants.

4.3.3 Implementation in Practice

Prior to implementation, the researcher met with the dietetic manager who identified the leadership team of three dietitians from within the department. To date, there are no recommendations in the literature regarding size of a leadership team, therefore, we proposed for a dietetic department of approximately nine to 16 full time equivalent dietitians, a team of approximately three staff would be appropriate based on previous hospital dietetic management experience. The two teams were provided with the same eight-stage implementation package and briefing on the implementation process. The leadership team at each test hospital commenced implementation with the lead researcher that included three workshops and weekly phone calls for ongoing support. The test sites implemented stages one to seven over a five-month period following the timeframes outlined in Figure 4.1. Stage eight, institutionalise new approaches, was not included in this evaluation as it was deemed ongoing and outside the timeframe of the evaluation period.

For the control hospital, no NCP implementation information was given to the department from the researcher and no implementation of NCP was undertaken during the test period. However, individual dietitians were still exposed to potential NCP education through the Dietitians Association of Australia and self-study.

4.3.4 Evaluation Process

Participants completed the validated 58-item online ASK NCP survey[2] containing multiple choice, Likert scale and open-ended questions administered using Qualtrics version 276612001 (Qualtrics Labs Inc, Provo, Utah, USA). The ASK NCP survey was administered pre and post implementation to assess change in knowledge, familiarity, confidence,

[2] Unpublished paper 1 – Development of a Nutrition Care Process Implementation Package in Hospital Dietetic Departments.

support, value, barriers, training and education constructs regarding NCP and IDNT. Additional questions assessed their experience including challenges, tools/resources and key elements to success. Weekly reminder emails were sent to the dietetic manager and participants over a two-week period to improve completion rates. No incentives were offered for completion. Qualitative data was obtained for the test sites through researcher written observations and a focus group post implementation at the test sites. Dietitians (n=24) who participated in the implementation were invited by the dietetic manager to participate in the focus groups. Attendance was based on the availability of the dietitian. One focus group session was conducted at each test site (n=11 total). A question guide was formulated to direct the focus group discussion about participant experiences relating to the implementation package materials, the implementation process within the department, and the open ended responses from ASK NCP survey. The researcher led focus group discussions were audio recorded for ease of transcription with prior permission from the participants.

4.3.5 Data Analysis

Anonymous quantitative data was double entered by the lead researcher and analysed using Predictive Analysis Software (PASW) for Windows, version 18.0 2009 (SPSS Inc., IBM, Chicago, IL, USA). Descriptive statistics and chi-square were completed for demographic data. Frequency statistics were used to present the number and proportion of subjects showing improvements (if any) in the survey results. Appropriate summary statistics such as minimum, maximum and medians were also used. As the majority of the variables were non-normally distributed ordinal variables, Wilcoxon signed rank (WSR) and Mann-Whitney U (MWU) tests were utilised on all comparisons for the purposes of consistency. The WSR test was initially used to determine whether there were significant changes pre and post implementation of the survey within the treatment and control groups. The MWU test was then applied to determine whether the changes in the test group were significantly different to the control group. More specifically, whether there were greater improvements in the treatment group versus the control. An alpha level of less than 0.05 was deemed significant. Focus

group responses were transcribed by the researcher and manually analysed for recurring keywords and phrases based on the analysis. They were grouped into themes then reviewed and validated by all authors.

4.4 RESULTS

Thirty-five dietitians completed the pre-implementation survey. Of these, 23 (n=14 from test sites / n=9 from control site) completed the post-implementation survey and were used to assess change in constructs (Table 4.1).

Table 4.1 Characteristics of dietitians in the test and control hospitals

	Test (n=14)	Control (n=9)	Total (n=23)
Gender			
Male	1	0	1 (4.4%)
Female	13	9	22 (95.6%)
Work status			
Full time	9	5	14 (60.9%)
Part time	2	1	3 (13.0%)
Casual	3	3	6 (26.1%)
Years as dietitian			
1-5 years	9	5	14 (60.9%)
6-10 years	2	4	6 (26.1%)
> 11 years	3	0	3 (13.0%)

A total of 12 participants were lost to follow up due to staff relocation or on leave from the workplace at the time the survey was completed. Most respondents were female (95.7%), worked full time (60.9%) and have been practicing as a dietitian for up to five years (60.9%). It was observed that there was less participants who had been practicing for >11 years (13.0%) compared to 1-10 years.

Table 4.2: Change in ASK NCP survey constructs between pre and post implementation of the Nutrition Care Process Implementation Package within and between Test (n=14) and Control (n=9) groups.

		Change			**Change within group[a]**	**Change Between Groups[b]**
		Positive change	**No change**	**Negative Change**	**P value**	**P value**
Knowledge[c]	Test	10/14	3/14	1/14	0.006*	0.277
	Control	5/9	1/9	3/9	0.429	
Familiarity[d]						
Total familiarity score[e]	Test	8/13	5/13	0/13	0.010*	0.804
	Control	5/8	3/8	0/8	0.041*	
I am familiar with the NCP[g]	Test	3/14	11/14	0/14	0.102	0.868
	Control	2/8	6/8	0/8	0.180	
I am familiar with the IDNT[g]	Test	5/13	8/13	0/13	0.025*	0.601
	Control	4/9	5/9	0/9	0.063	
I am aware of the DAA recommendation to adopt the NCP in Australia[g]	Test	5/14	7/14	2/14	0.257	0.781
	Control	3/9	6/9	0/9	0.083	
Value[d]						
Total Value Score[d]	Test	5/14	3/14	6/14	0.821	0.124
	Control	2/9	1/9	6/9	0.035*	
The NCP and standardized language are applicable to my area of practice[g]	Test	2/13	11/13	1/13	0.564	0.072
	Control	0/9	5/9	4/9	0.046*	
I see value of the NCP in my clinical practice[g]	Test	2/14	10/14	2/14	1.000	0.141
	Control	0/9	5/9	4/9	0.046*	

		Change			Change within group[a]	Change Between Groups [b]
		Positive change	**No change**	**Negative Change**	**P value**	**P value**
I see minimal benefit in changing my clinical documentation practice to incorporate the NCP	Test Control	1/14 1/9	10/14 3/9	3/14 5/9	0.705 0.096	0.224
I see the value of IDNT within my clinical practice[g]	Test Control	1/14 0/9	10/14 5/9	3/14 4/9	0.317 0.046*	0.305
I see minimal benefit in changing my clinical documentation practice to incorporate IDNT	Test Control	2/14 1/9	8/14 5/9	4/14 3/9	0.914 0.317	0.781
I do not feel the need to change my practice	Test Control	2/14 1/9	11/14 6/9	1/14 2/9	0.564 0.564	0.557
I feel isolated from knowledgeable colleagues with whom to discuss NCP/IDNT	Test Control	5/14 4/9	8/14 2/9	1/14 3/9	0.096 0.435	0.975
I feel incorporating the NCP/IDNT will improve patient care[g]	Test Control	1/14 2/9	8/14 4/9	5/14 3/9	0.096 0.480	0.688
Confidence[f]						
Total confidence score[e]	Test Control	8/14 4/9	6/14 4/9	0 1/9	0.011* 0.221	0.305
How confident do you feel to implement NCP into your own practice[g]	Test Control	4/14 3/9	7/14 5/9	3/14 1/9	0.165 0.257	0.877
How confident do you feel to implement IDNT into your own practice[g]	Test Control	6/14 2/9	8/14 6/9	0/14 1/9	0.026* 0.414	0.277
How confident do you feel about identifying the most appropriate nutrition diagnosis[g]	Test Control	5/14 1/9	9/14 6/9	0/14 2/9	0.034* 0.414	0.124

		Change			Change within group[a]	Change Between Groups [b]
		Positive change	**No change**	**Negative Change**	**P value**	**P value**
How confident do you feel in writing PES statements[g]	Test Control	5/14 3/9	9/14 5/9	0/14 1/9	0.034* 0.257	0.557
Support[d]						
Total support score[e]	Test Control	8/14 4/9	1/14 1/9	4/14 4/9	0.125 0.777	0.235
Implementing the NCP/IDNT within my own practice is important to me[g]	Test Control	3/14 3/9	10/14 4/9	0/14 2/9	0.083 0.334	0.948
Information on NCP/IDNT is readily available[g]	Test Control	5/14 4/9	6/14 2/9	2/14 3/9	0.146 0.607	0.647
The implications of incorporating NCP/IDNT into practice is not clear	Test Control	3/14 1/9	7/14 4/9	3/14 4/9	0.748 0.157	0.324
There is support at my workplace to implement NCP/IDNT[g]	Test Control	2/14 1/9	10/14 5/9	1/14 3/9	0.564 0.257	0.324
I have access to IDNT/NCP mentors[g]	Test Control	8/14 3/9	5/14 5/9	0/14 1/9	0.011* 0.257	0.144
Management is supportive of implementing NCP/IDNT[g]	Test Control	3/14 2/9	9/14 6/9	1/14 1/9	0.257 0.564	0.845
My co-workers are supportive of using NCP/IDNT[g]	Test Control	3/14 3/9	9/14 3/9	1/14 3/9	0.317 1.000	0.695
Concerns[d]						
Total concern score[e]	Test	3/13	8/13	2/13	0.785	0.845

		Change			Change within group[a]	Change Between Groups [b]
		Positive change	**No change**	**Negative Change**	**P value**	**P value**
	Control	4/9	2/9	3/9	0.861	
NCP/IDNT interferes with my professional autonomy	Test	2/14	11/14	0/14	0.157	0.744
	Control	3/9	5/9	1/9	0.317	
Generally I would prefer to continue my routine rather than change	Test	0/14	11/14	2/14	0.180	0.512
	Control	0/9	6/9	3/9	0.102	
I don't have time to use NCP/IDNT	Test	2/14	10/14	1/14	0.564	0.324
	Control	1/9	5/9	3/9	0.317	
Incorporating NCP/IDNT into my current practice will be inconvenient	Test	4/14	8/14	1/14	0.157	0.794
	Control	4/9	4/9	1/9	0.180	
Training[d]						
Total training score[e]	Test	11/13	0/13	2/13	0.006*	0.071
	Control	5/9	3/9	1/9	0.071	
I have had sufficient training to feel knowledgeable about the NCP/IDNT	Test	11/14	0/14	2/14	0.025*	0.043
	Control	5/9	3/9	1/9	0.096	
I have had sufficient training to feel comfortable implementing NCP/IDNT into my practice	Test	10/14	2/14	1/14	0.006*	0.069
	Control	5/9	3/9	1/9	0.096	
I require additional training specific to my area of practice[g]	Test	0/14	6/14	7/14	0.017*	0.235
	Control	0/9	6/9	3/9	0.083	

[a] Wilcoxon Signed Rank Test
[b] Mann Whitney U Test

[c]Multiple Choice responses used to calculate a total knowledge score
[d] 5pt Likert scale strongly agree-strongly disagree
[e] Total Corrected Score calculated from Likert Scale responses to questions within the construct
[f] 4 pt Likert scale very confident – not very confident
[g] Likert Scale recoded strongly disagree – strongly agree
* significant change within group at the 5% level of significance

ASK NCP = Attitudes Support Knowledge for Nutrition Care Process survey
NCP = Nutrition Care Process
IDNT = International Dietetics and Nutrition Terminology
DAA = Dietitians Association of Australia
PES = Problem, etiology, signs and symptoms

4.4.1 Knowledge

Although there was no significant difference between the test and control groups for total knowledge score (p=0.277), a significant increase within the test group was observed (p<0.01). Furthermore, only one out of the 14 participants in the test group recorded a negative total knowledge score and an increase in the score was observed for 10 participants (71%). In contrast, a third (33.3%) of the participants in the control group had a lower total knowledge score (Table 4.2).

4.4.2 Familiarity

No significant difference between the test and control groups was observed for total familiarity score (p=0.804), however, a significant increase within the test (p<0.01) and the control groups (p=0.041) was observed and the test group was significantly more familiar with the NCP post implementation compared to pre implementation (p=0.025). Furthermore, an increase in the score was observed for 57.1% of the test participants and 62.5% of the control participants (Table 4.2).

4.4.3 Value

No significant difference between the test and control groups was observed for total value score (p=0.124), however, a significant decrease within the control group was observed (p=0.035). Within the value construct, the control group had a significant negative response in relation to the statements that NCP and standardised language are applicable to their practice (p=0.046); they see value of the NCP in clinical practice (p=0.046) and the value of IDNT within their practice (p=0.046). Furthermore, a decrease in the total value score was observed for 66.7% of the control participants compared to 42.8% of the test participants (Table 4.2).

4.4.4 Confidence

Although no significant difference between the test and control groups was observed for total confidence score (p=0.305), a significant increase within the test group was seen (p=0.011) with an increase in the total confidence score observed in 57.1% of the test group. Within the confidence construct,

the test group were significantly more confident to implement IDNT into practice (p=0.026), to identify the most appropriate nutrition diagnosis (p=0.034), and writing problem etiology sign and symptom (PES) statements (p=0.034) (Table 2).

4.4.5 Support

No significant difference between the test and control groups was observed for total support score (p=0.235). Within the test group it was observe that they had a significant improvement in relation to access to IDNT and NCP mentors (p=0.011), with 61.5% showing improvements compared to 33.3% of the control participants (Table 4.2).

4.4.6 Concerns

No significant difference between (p=0.845) and within the test and control groups was observed for total concerns score.

4.4.7 Training

Although there was no significant difference between the test and control groups for total training score (p=0.071), a significant increase within the test group was observed (p<0.01). Within the test group significant improvement was observed in terms of sufficient training to feel knowledgeable about NCP and IDNT (P=0.025); had sufficient training to feel comfortable implementing NCP and IDNT into practice (p<0.01); and not requiring additional training specific to their practice area (P=0.017) (Table 2).

4.4.8 Focus Group Findings

Based on the focus group discussions, participants found the implementation package useful and would recommend use of the package to other dietetic departments wanting to implement NCP in the workplace. The package was reported to be particularly useful for new staff members, as it acted as a guide through the process. Specifically, participants found the nutrition diagnosis pocket book, presentations and leadership team to be the most useful components of the package.

"It was good having someone on the site as a main person to approach and good when you [the researcher] came in as well, its handy to pick your brain to get reassurance of what we are doing is right."

The least useful component was reported to be the email discussion groups. Restricted workplace access to computers and to some external websites limited the availability of discussion group platforms, however, participants agreed that in principle it would be beneficial with a compatible information technology system.

Suggested changes to the implementation package included creating tabs in the pocket book to improve ease of use, and circulating the document of common nutrition diagnosis early in the implementation rather than being developed at the end.

In regards to the change management process utilised, all focus group participants agreed that it assisted their understanding of NCP. The participants felt that the key elements to successful implementation of the package included the peer groups, leadership team, structured deadlines, submission of PES statements, and support. The main barrier to package use was time to meet as a department, particularly for part-time staff. It was identified that further support and specialist case studies would be required to assist ongoing implementation for stage eight, institutionalise new approaches.

"(We need) support from other sites when we don't know the answers …. I wouldn't know where to go if we get more and more complex questions as we get better at it."

4.4.9 Researcher observations in relation to the implementation process

The leadership teams within each of the two dietetic departments appeared to navigate the implementation process well. There were no questions raised

regarding the process, only issues specific to case studies and nutrition diagnosis options. We found that weekly contact with the leadership teams during stage five was particularly important to maintain motivation due to demands of clinical workloads. In this case, the research team assumed responsibility for motivating the leadership team. However in practice this would be the responsibility of the dietetic manager. There were issues with ensuring participation of part-time staff and this problem was resolved individually at each site through the use of teleconferences and individual peer sessions with a member of the leadership group. The email discussion group did not work effectively due to limitations with the workplace technology infrastructure, however, with an improved information technology system, this could be a useful tool, particularly to assist in clinical specialties to discuss nutrition diagnosis options and liaise with expert users.

4.5 DISCUSSION

To our knowledge this is the first study to evaluate the use of an NCP and IDNT for nutrition diagnosis implementation package modeled on a change management framework process within hospital dietetic departments. This was a pilot study, as such, we only had relatively small participant numbers. This restricted our ability to find significant results between the test and control groups. However, we were able to identify improvements within the test group. We can accept the hypothesis that dietitians utilising the implementation package were able to significantly improve their knowledge, confidence and training in using NCP and IDNT, while the control group who did not have access to the package did not improve in these areas. The control group was observed to significant decrease in value. An improvement in familiarity was observed in both the control and test groups.

4.5.1 Impact of Implementation Package

The implementation package evaluated in this pilot study significantly improved test participant's use of the NCP and IDNT for nutrition diagnosis in many areas including knowledge, familiarity, confidence and training.

Although no change was observed between the test and control groups, a positive directional trend was observed.

Our findings suggest that the program and education component of the implementation package, coupled with the change management framework, was successful in significantly increasing knowledge within our test population. An increase in knowledge is consistent with the findings of Zelig et al., (2011) who assessed the change in knowledge and attitudes of American dietitians in long term care settings regarding use of NCP and IDNT after completion of a web based course module. A control group was not used in that study (Zelig et al., 2011), however, our findings did not observe any change in knowledge between the test and control groups although a direction to effect was evident.

In regards to familiarity, both the test and control group showed a significant positive change to the overall familiarity score. However, the test group was specifically more familiar with IDNT for nutrition diagnosis post-implementation. This impact is important, with the identification of nutrition diagnosis and use of IDNT to form PES statements identified as the least familiar process of NCP (American Dietetic Association, 2008a; American Dietetic Association, 2008b; Gardner-Cardani et al., 2007;Hakel-Smith et al., 2005; Mathieu et al., 2005). During the test period, the NCP was promoted by the Dietitians Association of Australia (DAA) and discussed at local meetings within Western Australia as part of continuing professional development. Although no formal education was officially conducted by the DAA over the study period, this, in-conjunction with participation in the study as a control group, could have influenced familiarity results for the dietitians in this group. We do not see this as an issue, as the first stage of the change management framework is to increase awareness, which is occurring within the Australian dietetic profession. As the test group specifically increased familiarity with IDNT for nutrition diagnosis in comparison to the control group, this could be attributed to the implementation package and influence of education and training rather than outside influences. However, there was no significant change observed between the groups.

There was no change in the value scores of the test group (who were agreeable pre-implementation), however, the control group significantly decreased their value scores. This may have been due to the control group feeling 'left out' of the NCP implementation process, or the control may have lost interest in it after initial excitement around the NCP, resulting in a decrease in perceived value.

There was a significant positive change in the test groups training construct scores post-implementation. Particularly, participants felt they had sufficient training to feel knowledgeable about NCP and IDNT; to feel comfortable to implement it into their practice; and require less training post-implementation. Lack of knowledge, education and training are common barriers to implementing new processes (American Dietetic Association, 2008a; American Dietetic Association, 2008b; Zelig et al., 2011). These results confirm the importance of training and education as essential components of the change management process.

Both the test and control groups showed no difference pre and post-implementation with regards to benefits and concerns around the NCP. Participants were agreeable to the benefits of NCP and did not feel that it would interfere with professional autonomy. They also reported that incorporation into documentation would not be inconvenient. Although the implementation package did not have any change on the participants' views on the benefits of NCP, addressing the benefits and concerns is still an important component of the change process and should remain in the package. A different sample may not have the same positive outcome and this has been demonstrated in previous education intervention (Zelig et al., 2011) where inclusion of benefits resulted in positive change, and significant increase in attitude scores. Although no change was seen in this study, the change management process did not add any additional concerns.

Resources provided as part of the implementation package were essential for dietitians in the test groups. A pocket book of nutrition diagnosis was

printed locally with permission to reduce costs of importing from the USA. Since our study was conducted, there is now a similar pocket book available to buy within Australia at a cheaper cost. The online version of the IDNT Reference Manual (Academy of Nutrition and Dietetics, 2012) was not utilised in the hospitals due to inconsistent computer access. The pocket book was identified as an important resource within the package. The case studies provided to the peer groups as part of the implementation package were also considered important. These were designed as basic clinical case studies, and therefore incorporation of more advanced case studies would be beneficial once the NCP has been implemented. As part of stage eight, the final phase of the implementation package, the leadership groups were instructed to develop a site-specific document of common nutrition diagnosis statements based on their peer groups and fortnightly department meetings. The participants stated earlier access to a document outlining common nutrition diagnoses for situations to help the peer group discussions would be beneficial and should be considered in review of the package.

4.5.2 Conduct of the Implementation Process

We believe that the use of a structured change management framework contributed to the successful implementation of NCP via behaviour change and achieved a paradigm shift for some dietitians to utilise the framework. At the end of the study, both test hospitals continued to use NCP as part of their ongoing dietetic care and embedded into department policy and procedures. The process allowed us to ensure that the barriers and drivers to change behaviour were addressed. It was important to allow adequate time for each stage, particularly for education, as participants are required to comprehend new concepts, identify nutrition diagnoses and develop PES statements. The test sites progressed through the change management stages within the recommended timeframes, indicating these were realistic. The departments had established a sense of urgency through agreeing to participate in the study and having identified it as a priority by their managers and departments, as a result stages one and two were combined. This may have contributed to the positive outcome, however, for future use these stages may be separated if the sense of urgency is not evident.

Although there were no significant changes observed between the test and control groups for the support construct, the test group did show significantly improved access to NCP and IDNT mentors. The support of the leadership team and researcher was a valuable component as identified in the focus groups and researcher observation. The study by Zelig et al., (2011), identified lack of support as a barrier in implementing IDNT and NCP, however, this was not the case in our study population, potentially as the test groups were a purposive sample (Bowling, 2007) and implementation was already supported by management. Support is an important component to any change management and the leadership teams guided this process.

The main barrier to using the implementation package was incorporating part-time staff, particularly into the peer groups. This was not an issue for the presentation and education aspects as these were scheduled at times of departmental meetings where all staff were required to attend. One test site utilised teleconferencing for this purpose and provided additional support

from the leadership team. As inclusion of part-time staff in department change is a barrier, this topic requires further investigation and consideration of an alternative support method such as web-based applications.

For ongoing use of NCP and IDNT, extending networks of expert support beyond the individual hospital sites was identified, particularly for specialist conditions or complex case studies. Support networks would provide expert assistance on specifics of IDNT nutrition diagnosis, PES statements and case studies. For smaller hospital departments insufficient staff numbers may limit the formation of a leadership team or peer groups, therefore require this from an external source. Alternative methods of delivery such as web-based applications, internet technology, and video conferencing may also be investigated.

4.6 CONCLUSION

Strengths of this pilot study include the use of a control group, qualitative and quantitative investigation and the use of a change management model in the implementation package. However, there were several factors limiting extrapolation of our results to the wider dietetic community. Firstly, this was a pilot study and the sample size was small. This was due to the use of a purposive convenience sample that agreed to participate in the study and also movement of 12 staff during the five-month intervention phase. The small sample limited statistical significant findings between groups. The results within groups were promising. Extending this research to a larger sample size to achieve effect would be valuable. Another limitation observed was the under representation of dietitians with >11years experience. There are many reasons as to why this may have occurred, including the sample size as a limitation, making up only 13% of the workforce at the participating hospital or being on a form of leave in the duration of the study. As there was mandatory participation, opting out was not seen as a reason for this occurring. It would be beneficial in future studies with larger sample sizes to investigate whether years of practice as a dietitian has any impact on implementing the NCP. A cost benefit analysis of the implementation was not evaluated and this information would have been useful to quantify loss of productivity during the implementation phase and determine the total cost of implementation. Future research could benefit from including productivity information, as to our knowledge, no cost of implementation has been published to date. There was no quantitative measure of the implementation package including process, resources and tools. The focus groups provided qualitative feedback only, therefore future research projects should include quantitative measures of the process and components. Stage eight of the implementation process was not evaluated. Extending the length of the study to capture whether the full implementation of NCP and nutrition diagnosis was not only accurate but maintained would have been of benefit. Future studies should look to evaluate stage eight and the longer term use and accuracy of the NCP and IDNT for nutrition diagnosis. Lastly the NCP package only taught up to and including the IDNT for nutrition diagnosis, as it

has had the most work on terminologies and is the most unfamiliar step of the process (Hakel-Smith et al., 2005; Mathieu et al., 2005). Therefore the package would need to be amended to incorporate IDNT for the remaining steps of the NCP.

In conclusion, we demonstrated that a NCP implementation package utilising Kotter's eight stages of change, was effective in producing a small positive change within test groups, and resulted in ongoing use NCP and IDNT in two Western Australian dietetic departments. Stage eight, institutionalise new approaches, was not incorporated into the evaluation due to its ongoing nature, therefore, there is an opportunity for longer- term follow-up with the departments to determine ongoing use of leadership teams, peer group training and strategies of full integration into the dietetic departments processes.

Future research could include larger sample sizes for greater statistical power, and incorporate longer-term outcomes, cost benefit analysis and alternative methods for providing the change management implementation package.

CHAPTER 5

DISCUSSION

This chapter interprets the major research findings in light of other literature and the aims of the research, considers strengths and limitations, discusses possible implications for practice and makes suggestions for future research

5.1 RESEARCH FINDINGS

The aim of the research was to develop a NCP implementation package focusing on step two of the NCP, to meet the needs of hospital dietitians, and investigate its efficacy. In the formative phase (Phase One) an online survey ASK NCP was developed, validated and administered to dietitians in two groups, those who had and those who had not commenced an informal NCP implementation. These results, in conjunction with advice from key experts and review of the literature, were used to inform the development of an implementation package that incorporated a business change management model. In Phase Two the NCP package was implemented and evaluated in two dietetic hospital departments. Results were compared to a control hospital to determine the effectiveness of the implementation package. Key findings from Phase One and two are outlined below.

5.1.1 Dietitians exposed to NCP and IDNT implementation have improved knowledge and confidence

In the Phase One we hypothesised that dietitians who had not yet commenced NCP implementation would have a lower knowledge score and less confidence to implement NCP. As a result they would require increased support, education and training compared to dietitians who had already commenced using NCP and IDNT. In Phase Two we hypothesised that dietitians who had used the NCP implementation package would significantly improve their knowledge and confidence to implement NCP compared to dietitians who did not have access to the package. The results from the study supported the hypotheses. The ASK NCP survey showed that dietitians who had yet to commence implementation of NCP were overall less knowledgeable, less familiar and less confident to implement, and required greater training, resources and support to implement compared to those who had already been exposed to NCP implementation. This is

consistent with observations in the literature (Atkins et al., 2010; Hakel-Smith, 2005; Higuchi et al., 1999; Mathieu et al., 2005; Paganin et al., 2008; Parrot, 2012; Stocker, 2001; Zelig, 2011). This study was the first to use the ASK NCP survey to clearly assess dietitians attitudes, knowledge, barriers regarding NCP and its implementation. In Phase Two we found that although there was no change seen between the test and control groups, within the test group they significantly improved their knowledge and confidence indicating that the package had an impact in those areas.

5.1.2 Key components for NCP implementation

A second finding from the formative Phase One was the identification and evaluation of key components for successful implementation and evaluation of the package. Post-implementers were over one year into implementation, thus we were unable to determine which aspects of their implementation process had contributed to their knowledge, confidence and training scores, however, we did obtain information relating to what they viewed as the valuable components of their implementation process through the ASK NCP survey. For successful implementation key factors identified included: access to resources; time to practice; support and leadership; and understanding the need for and benefits to change. All participants identified time to implement, support, direction on how to implement and use NCP and IDNT, and training and resources to implement, as being important factors for successful implementation. To address these, three concepts were embedded in the package. These were: (1) resources such as case studies, education presentations and ready reckoner sheets; (2) leadership through the establishment of the leadership team, and support through regular peer groups and access to the leadership team; (3) time to implement the self-paced package, with weekly practice and training on NCP, and time to explore the rationale for change and the benefits to the dietitian, patient and department. These three factors of resources, leadership and time aligned with previous literature (Axelsson et al 2006; Florin et al 2005; Mueller et al., 2008; Muller-staub 2009; Paganin et al 2008; Roberts and Shiner, 2009; Stocker 2001; Thorodddsen 2007; Higuchi 1999; Van Heukelom et al., 2011; Zelig 2011) that suggests they are drivers and essential to successful

implementation, and thus, were embedded in the implementation package. Qualitative findings from the evaluation in Phase Two suggested that participants agreed that the training was adequate. Although no difference in change was observed between the test and control group, the test group were significantly more confident to use NCP compared to pre-implementation.

5.1.3 Importance of supportive structures

The formative phase identified that lack of support was a barrier to implementation of NCP, consistent with observations in the literature (Van Heukelom et al., 2011) This thesis aimed to improve the support of dietitians to implement NCP through the use of Kotter's eight stages of change framework in the implementation package. A supportive management structure is a significant component of change management (Kotter, 1996) and was a focus of the implementation package. Due to the convenience purposive sampling, and commitment by the management staff at each hospital site, in Phase Two of the study, the formation of a leadership team and support network was readily established. The formation of a leadership team to guide the implementation process increased support for the department manager and staff. The implementation package provided a consistent and efficient method to implement change across the sites. Supportive management structures were a clear enabler of success, and coupled with the peer support were an essential component to the implementation.

5.1.4 Time is a barrier

Time to implement has previously been identified as a barrier to NCP and IDNT use (Higuchi et al., 1999; Stocker, 2001; Van Heukelmon et al., 2011; Zelig, 2011), and was also identified as a concern by pre-implementers in this study. Participants reported on their clinical workloads and were concerned about the amount of time required to learn, develop and embed a new skill into practice. To overcome this issue, the implementation package provided recommended timeframes in weeks to implement each stage of the package. This provided a timeframe for managers and dietitians to move

through each stage, and schedule peer group meetings, learning and education appropriately. As a result, the dietitians did not feel rushed and had adequate time to learn and practice the skill. The evaluation suggested timeframes were appropriate and realistic, thus, allowing managers and dietitians to plan appropriately and be realistic about their implementation process. As a result, no changes to the timeframes are recommended.

5.1.5 Initial and ongoing training is required to implement NCP

The formative research in Phase One identified that a barrier to implementation was a lack of NCP training and knowledge on how to implement NCP. This is consistent with previous findings in the literature (Atkins et al., 2010; Desroches et al., 2014; Hakel-Smith et al., 2005; Parrott, 2012; Van Heukelmon et al., 2011). The dietitians in this study valued NCP and IDNT and the cohort was motivated to use it, however, they were not familiar with the detail. It was hypothesised that the implementation package would improve access to training and thus improve knowledge. Phase Two successfully provided this in the short-term. After implementation of the NCP package, the test group reported they had appropriate training that resulted in increased knowledge and confidence to use NCP in practice compared to pre-implementation. These positive results reflect that a formal, clear process that provided different modes of training including, regular in-services, peer group meetings, and whole of dietetic team consolidation meetings was beneficial.

In Phase One, although the dietitians who had undergone some implementation were significantly more knowledgeable than those who had not, only 13% of the total dietitians correctly answered all the knowledge questions. This suggests that training is not only important in new skill acquisition and behaviour change, but needs to be ongoing to fully integrate the NCP and IDNT into medical record documentation (Atkins, 2010). In Phase Two, the test group had significantly improved their knowledge score suggesting the package had a positive impact on knowledge acquisition, however, long term knowledge retention was not assessed here as this was outside the scope of the study. This is discussed further in study limitations.

5.1.6 Change management framework provides structure for implementation

Formative use of the ASK NCP survey reported that 48% of pre-implementers identified it would be difficult or very difficult to implement NCP. Furthermore, an unplanned approach to implementation was identified as a concern has been reported by others as a key factor to implementing NCP (Gardner-Cardani et al., 2007; Matheiu et al., 2005; Roberts and Shiner, 2009; Van Heukelmon et al., 2011). This finding supported the development of the structured approach in the implementation package that, in Phase Two, was seen as an important factor in implementing NCP. Overall the use of Kotter's eight stages of change framework to underpin the implementation package likely contributed to the successful implementation in the two WA hospitals.

5.1.7 Ability to write PES statements

Results from the ASK NCP survey identified that pre-implementers were concerned that NCP would not only decrease productivity, but they would have difficulty determining accurate Problem (a)Etiology Sign and Symptom (PES) statements that are developed as part of the nutrition diagnosis component of NCP. Identification of a nutrition diagnosis and use of IDNT to document is an essential component of the NCP and clearly delineates dietitians involvement with the patient allowing clear documentation and communication between health professionals (American Dietetic Association, 2008a; Hakel-Smith 2005; Lacey and Pritchett 2003; Corado and Pascual). A main focus of the implementation package, stage five (empowering broad based action), allowed the time to learn, practice and develop confidence when using PES statements and IDNT. This was achieved through key structures including weekly peer support groups, case studies, fortnightly department reviews and guidance from the leadership group prior to documenting in the medical records. The peer groups and leadership group reviewed the accuracy of the PES statements. Although there was no formal method of external expert assessment of the PES statements, the challenge of writing PES statements was improved by the implementation package with

dietitians feeling more confident in their abilities and increased user familiarity, particularly around PES.

5.2 SIGNIFICANCE OF THESIS

This research is significant for several reasons. Firstly, there is limited published information on dietitians knowledge, attitudes, barriers and requirements to implement NCP and IDNT, within the Australian context. Although dietitians have been surveyed regarding NCP and IDNT in America, Canada and Korea (Atkins et al., 2010; Desroches et al., 2014; Kim and Baek, 2013; Regan et al., 2009), this is the first known study to develop a validated and reliable survey tool, ASK NCP, that measures the constructs of knowledge, familiarity, confidence, support, value, barriers, training and education regarding NCP and IDNT. This tool has been used subsequently in Queensland to assess dietitians' pre and post a state-wide implementation strategy (Vivanti et al., 2011) and by the Dietitians Association of Australia to assess the professional association members as part of a national survey in 2012 and 2014. This is significant, as consistent comparable data has been collected and repeated surveys can assess change. The ASK NCP survey was effective in obtaining data, however, to remain consistent with practice the survey would require modification should any major change to the NCP or IDNT occur.

Secondly, to our knowledge this is the only study that evaluates an implementation package based on a change management framework for NCP and IDNT within hospital dietetic departments against a control group. As a result, we were able to assess change as a direct result of the implementation. This project has added valuable and unique information to the body of literature on NCP and IDNT within Australia and internationally. This is important for the profession moving forward in adopting and utilising NCP and IDNT. This study sets a solid base for future implementation within Australia and internationally. It also highlights value of a change management framework in introducing new concepts and models to dietetic practice.

5.3 STRENGTHS AND LIMITATIONS

There are several strengths to this thesis. Firstly, the participants in the formative phase were from two distinct groups, those that had exposure to informal NCP training and those who had received no NCP training. The groups were also separated by geography, with participants based in Queensland and Western Australia. This limited the exposure to each other to transfer knowledge or information. In addition a control group was included in Phase Two. This had not been used in a previous study by Zelig et al., (2011), allowing us to better assess the impact of the implementation package outside of potential external influences. A second strength was the collection of both quantitative and qualitative data to inform the package development and its evaluation. The use of focus groups allowed the researcher to further explore participant feedback and identify specific information on the use of resources, perceptions about the process including further exploration of barriers and drivers. Thirdly, the response rate to the ASK NCP online survey in the formative phase was relatively high at 62% (Baruch and Holtom 2009; Nulty, 2008; Yun and Trumbo, 2000) with equal respondents from the pre and post-implementation groups. Thus we can be confident that these results reflect the participant cohorts and generalisable to other dietitans. Lastly, the use of a change management framework in the implementation package was a strength providing structure and direction for each stage.

There are several limitations to this thesis that are important to recognise. Firstly, the sample size in the Phase One was limited by the number of hospitals in Australia that had undergone any level of NCP implementation. In 2010, only three hospitals in Queensland had commenced NCP use, two of which were included in the study. A sample of dietitians internationally was deemed inappropriate, due to differences in dietetics practice and education with Australia and varied use of the NCP. This study examined the Australian context and the concerns, barriers, requirements for Australian dietitians. In Phase Two, the sample size limited statistically significant findings between the test and control, however, the sample was large

enough to detect statistical significant differences within groups. There was also an observed drop out of dietitians with >11 years experience practicing as a dietitian from phase one to phase two of the study, resulting in the population being under represented in phase two. As participation in the study was mandatory, this reduction is likely to be from other factors such as leave (including annual leave, maternity leave and long service leave) or a change in work status. This cohort may potentially not be as motivated to change as dietitians with less years of experience, however, due to the small sample size it was not possible to make comparisons. The two hospitals that had already undergone implementation in QLD and the hospitals that had yet to undergo implementation in WA were convenience samples and therefore potentially more motivated to make the change and embed NCP and IDNT for nutrition diagnosis into practice. As a result, stages one and two of the change process were supported by management and were relatively quick to complete. The sample population was another limitation. Although the NCP has been identified to have many applications in dietetic practice (American Dietetic Association 2008a, American Dietetic Association 2008b, Lacey and Pritchett, 2003), this study was limited to dietitians in the hospital setting. The use of the structured implementation process could be utilised in other fields of dietetics, however, the specific content would require modification to the specific field of practice. For example, Myers (2014) discussed the use of NCP in public policy advocacy by the AND. It is not known if the NCP implementation package developed as part of this study is transferable to other fields of practice.

The sizes of the dietetic departments in Phase Two were another identified limitation in the study. The research was undertaken in large dietetic departments, where a number of dietitians could form a leadership team and peer support groups. The package in its current form may be less effective for smaller departments (<5 staff) and sole practitioners, as the processes require multiple staff. The package would have to be adapted and external support networks created for it to be adopted by smaller departments and sole practitioners. For example, the package could be delivered online with offline or virtual peer support groups. Lastly, the scope of this study was

short term (less than 12 months), and did not incorporate stage eight or longer term evaluation. Although longer term follow up of the study cohort was outside the scope of this study, evaluation of the longer-term support and education requirements of clinical dietitians to ensure NCP and IDNT for nutrition diagnosis is embedded and maintained in practice would be useful. To date, there is no published literature on this area.

Evaluation methodology was another limitation identified. The ASK NCP survey quantitatively assessed the constructs attitude, support, knowledge, and the focus group provided qualitative feedback, however, there was no quantitative evaluation of the implementation package, the processes, tools and resources within it. As the focus group only provided contextual feedback, support with a quantitative assessment would have further enhanced the quality of results. As this was identified as a pilot study, future research should look to include a quantitative measure.

5.4 IMPLICATIONS FOR PRACTICE

The outcomes of this study contribute to the body of literature on NCP and IDNT implementation and provide useful information to those dietitians in clinical services who are not sure how to commence implementation.

5.4.1 Features of the NCP Implementation Package

Although dietitians' views on NCP and IDNT have been evaluated internationally (Atkins et al., 2010; Kim and Baek, 2013), a validated and reliable tool has not been used. This study has validated and produced the ASK NCP survey, which has been used to evaluate attitudes, support and knowledge of Australian dietitians. As it is an Australian survey, it provides Australian dietetic managers with locally appropriate information to advocate for NCP and IDNT adopting in their services. Subsequent use of the survey for research as detailed previously demonstrates the potential of the survey to collect large-scale data for comparative research purposes, and has already been used to survey and compare at a national level in Australia, having now being administered twice. The survey could also be adopted by

dietetic tertiary programs to determine student understanding of NCP and IDNT and assist in the development of student education tools, as well as incorporated into online learning. It is important, however, that the survey be reviewed on a regular basis to ensure currency and accuracy of the knowledge based multiple choice questions. It will also require modification to include assessment of dietetic knowledge, skill and attitudes regarding IDNT for the additional steps of the NCP being assessment, intervention, monitoring and evaluation.

Uptake of NCP and IDNT in Australia has been inconsistent with few Australian tools and information available on the topic. To date the majority of the education and implementation information has been developed by the ADA of the USA and some of the tools and information does not transfer to the Australian context. For example, information in the case studies does not use the same medical terminology as Australia and different units of measurements. The literature provides no guide or formal process for implementation, but only a service approach (Gardner-Cardini et al., 2007; Mathieu et al., 2005; Roberts and Shiner, 2009; Van Heukelmon et al., 2011). In the past few years, DAA has made available to its members webinar education and materials including frequently asked questions, presentations and access to the online IDNT reference manual (Academy of Nutrition and Dietetics, 2013), however, they are not supported by a structured program. This study provides Australian context information and a detailed how to 'guide' in the form of the implementation package with a focus on step two of the NCP. We have shown this package encourages and supports Australian hospital dietetic departments to commence implementation, and supports dietetic managers in their department's change management process. As well as providing relevant resources and tools to assist in the process.

5.4.2 Scope of the NCP Implementation Package

The NCP implementation package has the potential to be used beyond hospital dietetic practice and support university education. In Australia, it is currently a requirement of university students to have an understanding and

application of NCP and IDNT as it is a requirement of the Dietitians Association of Australia (DAA) National Entry Level Competencies (Dietitians Association of Australia, 2010). Despite this, as it is not readily embedded into dietetic practice at present, this can be a barrier for the students to further develop their skills while on placement and in the workforce. The package can act as a tool for the university programs in assisting them to introduce and educate the concept to the students. In turn, as the NCP becomes more readily used in the workplace, dietitians can assist the education process and embed the practice and in turn encourage and support ongoing uptake in Australia.

Although developed for Australian hospital dietitians, the implementation package has the potential to be applied internationally. This is currently occurring as part of a PhD study. Reviewing the delivery method to include online modalities will support its transference to a wider population. In addition, reviewing the currency of resources and tools, and also expanding to incorporate IDNT for all steps of the NCP will thus allow a complete NCP implementation process.

5.4.3 Addressing ongoing barriers

Barriers to dietitians adopting and implementing the NCP and IDNT for nutrition diagnosis were identified from this study, however, the NCP implementation package may have a positive impact and assist in the profession overcoming them.

A lack of identified expert knowledge on the area has an impact in terms of the accuracy and quality control of documentation, as well as support for complex cases and scenarios. The more hospital dietitians who are using NCP and IDNT, the greater the knowledge base in Australia. This can lay the foundation for gathering valid, reliable data on nutrition care by dietitians. The IDNT was developed in America and tends to be primarily used there, however, is recognised internationally as part of the best practice nutrition care model and thus implementation has commenced internationally including Canada, Korea, and New Zealand. International contributions to IDNT revisions are encouraged and welcomed. Increasing NCP use and thus

the body of knowledge in Australia can contribute to the improvement and enhancement of the terminology and international acceptance.

Encouraging and supporting hospital dietitians in Australia to adopt NCP and IDNT is an important step in preparedness for e-health and electronic medical record documentation (O'Sullivan et al., 2011). Australia is currently part of an international collaboration to have IDNT incorporated into Systemised Nomenclature of Medicine Clinical Terms (SNOMED CT). SNOMED CT is an internationally preeminent clinical terminology and the national terminology for Australia (National E-Health Transition Authority, 2010) and provides the core terminology for e-health. The integration of IDNT into computerised medical record systems is beneficial for creating datasets and efficiently measuring health outcomes as a result of nutrition care (Zelig, 2011) and information exchange (Atkins et al., 2010; O'Sullivan et al., 2011). A pilot study that evaluated an online electronic record prototype incorporating the NCP and IDNT for use in private practice reported that an electronic system is likely to be well accepted by dietitians (O'Sullivan, 2013). Rossi et al., (2014) found an electronic system improved efficiency of total time spent by the dietitian by 13 minutes per consult and a greater number of nutrition related diagnoses were resolved compared to a manual paper based system for capturing NCP and IDNT. This study highlights the benefit that electronic systems can have in documentation, thus Australian dietitians need to be prepared and knowledgeable on NCP and IDNT in preparation for its introduction into electronic health systems.

Time to implement NCP was an identified barrier in the literature and supported by the outcomes of this study. The NCP implementation package provides a process to assist dietetic departments in identifying the timeframes required to implement, but also the package has the potential to support part time staff and those professionally isolated through expanding to online delivery and support, which is currently being incorporated in a PhD study.

It has taken over ten years for the NCP and IDNT for nutrition diagnosis (step two of the NCP) to be successfully implemented in American clinical dietetic settings, therefore Australia comparatively is in the early stages of adoption. The ASK NCP survey and NCP implementation package value adds to Australian dietetic efforts to incorporate the standardised model and language and encourage the timely adoption and use in medical record documentation in both paper based and electronic formats.

5.5 SUGGESTIONS FOR FUTURE RESEARCH

There is great scope for future research on NCP and IDNT implementation based on this thesis.

5.5.1 Extend sample size and population

Future research could incorporate larger sample sizes and investigate whether the implementation package and change management framework is transferable to other countries and dietetic populations including Asia, thus extending the scope of application. In addition, future research could re-model the package to investigate alternative methods of delivery such as web based applications and internet technology, as well as the formation of expert support networks to act as peer support. The advantage of an online delivery modality is increased accessibility, especially for those professional isolation, development and access to a broader expert user group and international collaboration. Challenges will include maintaining the currency of the information, expanding to practice settings beyond hospital dietetics and relevance to international user groups.

5.5.2 Different practice settings

The AND has shown NCP to be relevant across different practice settings (Myers, 2014), however, it may be applied differently and may not require the use of a standardised terminology. Further research on the application, and development of education for NCP and IDNT within different dietetic practice areas including community, public health (Myers, 2014) and food service settings would be beneficial to the extended scope and use of NCP.

5.5.3 Evaluation of Managers

The ASK NCP survey investigated dietitians knowledge, attitudes, confidence, familiarity, barriers and training requirements, but does not specifically identify managers of dietetic departments to differentiate their views from those of their staff. Greater exploration of the experiences of dietetic managers, barriers, requirements and drivers to implement would be beneficial for future research given their critical role in supporting and driving the change process. Without manager support, implementation is difficult. It is important to recognise that not all managers of dietitians are dietitians themselves, and therefore further justifies investigation of managers as a separate cohort to determine their views and needs for NCP implementation.

This thesis utilised a convenience sample, however, it would be useful to evaluate the change management framework in hospital dietetic departments where there was less support by management and/or motivation to implement, to further evaluate the efficacy of the implementation package and additional resources or actions that may be required in stages one to four.

5.5.4 Cost benefit

An area of interest for many managers of dietetic services is the cost benefit of implementing the NCP and IDNT. There is a large time investment into the implementation process and it would be useful to quantify any loss of productivity during the implementation phase and determine total cost of implementation. This information would be beneficial to assist in the planning and justification of implementation. This should be extended to determine cost saving once NCP and IDNT is implemented compared to the current method of documentation such as SOAP. An increase in productivity by up to 30% has been reported in the USA (Corado and Pascual, 2008) with use of NCP, however, this needs to be explored in other populations.

5.5.5 Longer-term study

The scope of this study was short term, with the evaluation occurring pre-implementation and immediately post-completion of stage seven of implementation. Longer-term follow up of the study cohort was outside the available timeframe for this study. Evaluation of longer term outcomes would be useful, as so far there is no published literature on this area. Results of this study demonstrate that in the short term, the implementation package has a positive impact on knowledge, confidence and familiarity of NCP and IDNT for nutrition diagnosis. Despite this, knowledge acquisition does not always translate to long-term behaviour change. Longer-term research could determine if the behaviour change continued and what training and education is required to maintain the behaviour change. This would also assist in adopting the IDNT for other stages of the NCP which have not yet been a priority, including assessment, intervention, monitoring and evaluation.

5.5.6 Electronic implementation

The implementation package and process that was developed and evaluated in this study was paper based, as the dietetic departments were not currently utilising electronic medical record documentation. Many countries do not use electronic systems and therefore the results of this study could be transferable, however, e-health is the future in health care and is planned to be adopted in Australia in the future. Initial work by Rossi et al., (2013) suggests time-saving benefits of electronic documentation in NCP, therefore it would be beneficial to adapt the implementation package for use in electronic systems.

The use and incorporation of standardised terminology and documentation into electronic systems and development of databases allows the collation of data across health sites, services, states and countries. This can be used for research into the impact of medical nutrition therapy on patient outcomes and inform practice. Further work is required to ensure uniform use of the terminology within services and between countries to ensure meaningful data is being collected. Information collected could be used for comparison

studies, information exchange, statistical reporting and assessment of nutrition outcomes and performance.

As follow-on research to this project, there is currently a PhD project underway at Edith Cowan University to develop a website and online community based on the implementation package and resources produced by this project, which will incorporate the validated ASK NCP survey. Materials will be adjusted for international use, and hospital departments in Asia and Europe will undertake the online implementation to evaluate its efficacy and process. This highlights the extended scope of research that is already being planned based on the work in this thesis.

5.5.7 Quantitative Measures of Accuracy

This study focused on the process of 'how to' implement NCP and IDNT for nutrition diagnosis within the hospital dietetic context for which there was positive results. However, it did not attempt to quantitatively measure whether the nutrition diagnosis statements (PES) were accurate based on the dietitians assessment of the patient. There was a reliance on self-assessment and no verification process embedded. Future research should look to assess the accuracy of the NCP documentation. This would include the critical thinking required to determine appropriate assessment methods and information, identify the nutrition diagnosis, determine the intervention strategy based on the assessment data and nutrition diagnosis, and selecting appropriate indicators/measures for monitoring and evaluation.

5.6 CONCLUSION AND OUTLOOK

This study contributes to the expanding research and information published on NCP and IDNT and identifies opportunities for future development to continue support for implementation within Australia and internationally. We have shown that providing a structured and supported implementation package utilising change management principles to hospital dietitians supports implementation of NCP and IDNT into practice. There is scope to extend knowledge further, and it is exciting where this can take the future of

dietetics once the NCP is successfully embedded in all standard hospital dietetic practice.

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APPENDIX ONE

Reliability Survey

Block 4

Evaluating the Implementation of Standardised Nutrition Language for Hospital Clinical Dietitians

Thank you for participating in the reliability testing of components of a questionnaire designed for research in evaluating the implementation of standardised nutrition language for hospital clinical dietitians.

You will be asked to complete the questions today, and then will be re-sent the same questions in 5 days time, the 21st of December, to complete.

Your time and effort is appreciated.

By completing this survey your results wil be anonymous, and we will not be able to identify you in anyway. However, so that your answers in this survey can be linked with answers in upcoming surveys, while you still remain anonymous, we ask that you enter your own individual code.

The code will be:
- the first two letters of your mothers maiden name,
- the number of your home street address,
- the first letter of your fathers first name,
- the first letter of your fathers middle name, and
- the last number of your birth year.

For example, if your mothers name is Jane Doe, you live on 9 Brisbane Road, your fathers name is John Andrew Smith and you were born in 1980, your code would be: DO9JA0.

Reminder, this code will not be used to identify individual participants.

Your anonymous respondant code

The first two letters of your mothers maiden name	
The number of your home street address	
The first letter of your fathers first name	
The first letter of your fathers middle name	
The last number of your birth year	

Block 2

How many years have you been practicing as Dietitian

What is your gender

What is your current work status?

Default Question Block

How strongly do you agree with the following statements?

	Strongly agree	Agree	Neither Agree nor Disagree	Disagree	Strongly Disagree
I am familiar with the American Dietetic Association Nutrition Care Process (NCP)	○	○	○	○	○
I am familiar with the International Dietetic & Nutrition Terminology (IDNT)	○	○	○	○	○
I am aware of the DAA recommendation to adopt the NCP and IDNT in Australia	○	○	○	○	○

What is the first step in the Nutrition Care Process (NCP)

- ○ Nutrition diagnosis
- ○ Monitoring and evaluating
- ○ Nutrition assessment
- ○ Nutrition intervention
- ○ Nutrition screening
- ○ Don't know

Please rate the following statements:

	strongly agree	Agree	Unsure	Disagree	Strongly Disagree
The NCP and standardised language are applicable to my area of practice	○	○	○	○	○
I see the value of the NCP within my clinical practice	○	○	○	○	○
I see minimal benefit in changing my clinical documentation practice to incorporate the NCP	○	○	○	○	○
I see the value of IDNT within my clinical practice	○	○	○	○	○
I see minimal benefit in changing my clinical documentation practice to incorporate IDNT	○	○	○	○	○
I do not feel the need to change my clinical practice	○	○	○	○	○
I feel isolated from knowledgeable colleagues with whom to discuss the NCP/IDNT	○	○	○	○	○
I feel incorporating the NCP/IDNT will improve patient care	○	○	○	○	○

The following set of questions relates to your knowledge of the Nutrition Care Process and IDNT

Etiology is documented in which step of the Nutrition Care Process

- ○ Nutrition assessment
- ○ Nutrition diagnosis
- ○ Nutrition intervention
- ○ Nutrition monitoring & evaluation
- ○ Don't know

Which is not a nutrition diagnosis

- ○ Excessive protein intake
- ○ Excessive carbohydrate intake
- ○ Dumping syndrome
- ○ Food & nutrition related knowledge deficit
- ○ Don't know

Which of the following terms is the standardised term to use when describing insufficient intake?

- ○ Poor intake
- ○ Not enough intake
- ○ Does not eat well
- ○ Inadequate
- ○ Don't know

Which of the following are the domains of the nutrition diagnosis in the NCP?

- ○ Food and/or nutrient delivery, nutrition education, nutrition counselling, coordination of nutrition care
- ○ Intake, clinical, behavioural/environment
- ○ Nutrition-related behavioural and environmental, food and nutrient intake, nutrition related physical signs and symptoms, nutrition related patient client centered
- ○ Food and nutrition, anthropometric, biochemical, medical and social diagnosis
- ○ Don't know

The connectors used in a PES statement are

- ○ Related to, as evidenced by
- ○ Due to, as evidenced by
- ○ Related to, signs and symptoms
- ○ Due to, signs and symptoms
- ○ Don't know

The nutrition diagnostic term can be found in which portion of the PES statement

- ○ Etiology
- ○ Problem
- ○ Signs & symptoms
- ○ None of the above
- ○ Don't know

Biochemisty values or weight status may be used in which part of the PES statement

- ○ Problem
- ○ Etiology
- ○ Signs & symptoms
- ○ Any of the above
- ○ Don't know

Rate each question on a scale

	Very confident	Somewhat confident	Unsure	Not confident
How confident do you feel to implement the NCP into your own practice	○	○	○	○
How confident do you feel to implement IDNT into your own practice	○	○	○	○
How confident do you feel about identifying appropriate nutrition diagnosis	○	○	○	○
How confident do you feel in writing problem etiology symptoms (PES) statements	○	○	○	○

CASE STUDY

A 70 year old man (weight 60kg, height 170cm) who lives alone was diagnosed with heart failure 3 months ago. Since then has has lost 12 kg from difficulty breathing (dyspnoea) and shortness of breath (SOB) and has difficulty consuming large meals as he becomes tired easily. Assessing dietary intake was difficult. he can no longer shop or cook and he uses many foods which are packaged and high sodium for convenience.

Here are 2 possible PES statements:

A: Inadequate energy intake related to dyspnoea, SOB as evidenced by 12kg weight loss

B: Inadequate food and beverage intake related to inability to shop and cook as evidenced by energy intake of being at least 2000kJ less than estimated requirements, 12kg weight loss in 3 months and reported early fatigue.

Choose the response that best describes the better choice of a PES statement and the best rationale for that choice

- ○ A is preferred because dyspnoea and SOB is the true root cause of the nutrition diagnosis
- ○ A is preferred because it is briefer and energy intake is more specific than food and beverage intake
- ○ B is preferred because it provides specific signs and symptom related to the nutrition diagnosis
- ○ B is preferred because the nutrition diagnosis is broader and encompasses the global problem that needs addressing
- ○ Don't know

The following questions relate to your current practice

Please choose the statements that best applies to your current practice

- ○ I am not currently using PES statements in my charting and I do not plan to use them
- ○ I am not currently using PES statements in my charting but I intend to implement them within the next 6 months
- ○ I am not currently using PES statements regularly but I will fully adopt them into my practice within 3-6 months
- ○ I have incorporated PES statements into my charting and I have used them for less than 3 months
- ○ I have incorporated PES statements into my charting and I have used them for 3-6 months
- ○ I have incorporated PES statements into my charting for more than 6 months
- ○ I have used PES statements in the past but I am not currently using them

Other than PES statements, have you implemented additional steps of the nutrition care process

- ○ Yes
- ○ No

If yes, please indicate which step(s) of the NCP you have incorporated into your charting (select all that applies)

- ○ Assessment
- ○ Intervention
- ○ Monitoring and evaluation

Please rate the following

	Strongly agree	Agree	Unsure	Disagree	Strongly Disagree
Implementing the NCP/IDNT within my own practice is important to me	○	○	○	○	○
Information on NCP/IDNT is readily available	○	○	○	○	○
The implications of incorporating NCP/IDNT into practice is not clear	○	○	○	○	○
There is support at my workplace to implement NCP/IDNT	○	○	○	○	○
I have access to IDNT/NCP mentors	○	○	○	○	○

Management is supportive of implementing NCP/IDNT	○	○	○	○	○
My co-workers are supportive of using NCP/IDNT	○	○	○	○	○
There is insufficient time on the job to implement new ideas such as NCP/IDNT	○	○	○	○	○

Please rate the following

	Strongly agree	Agree	Unsure	Disagree	Strongly Disagree
NCP/IDNT interferes with my professional autonomy	○	○	○	○	○
Generally I would prefer to continue my routine rather than change	○	○	○	○	○
I don't have time to use NCP/IDNT	○	○	○	○	○
Incorporating NCP/IDNT into my current practice will be inconvenient	○	○	○	○	○

Please rate the following

	Strongly agree	Agree	Unsure	Disagree	Strongly Disagree
I have had sufficient training to feel knowledgeable about the NCP and IDNT	○	○	○	○	○
I have had sufficient training to feel comfortable implementing the NCP/IDNT into my practice	○	○	○	○	○
I require additional training specific to my area of practice	○	○	○	○	○

WA only

How prepared do you feel to implement NCP and IDNT within your workplace?

- ○ Very prepared
- ○ Somewhat prepared
- ○ Not very prepared
- ○ Not prepared at all

Do you feel with further training and support you will feel confident to implement NCP and IDNT within your work practice and use for clinical documentation?

- ○ Yes
- ○ Unsure
- ○ No

What benefits do you anticipate will occur when you adopt the NCP and IDN into your practice (select all that apply)

- ☐ The NCP provides a consistent structure and framework for nutrition care
- ☐ Standardised language provides dietitians with a common vocabulary to identify nutrition problems
- ☐ It will allow more concise documentation
- ☐ It will allow for more consistent care when patients transfer services
- ☐ It will encourage critical thinking
- ☐ It will facilitate communication with other health care professionals
- ☐ It will assist in helping dietitians become recognised as more valuable team members
- ☐ It will improve patient care
- ☐ There are no benefits to adopting NCP/IDNT
- ☐ Other (please specify)

What are your main concerns about adopting NCP and IDNT into your practice (select all that apply)

- [ ] It will decrease my productivity during implementation
- [ ] I feel that the NCP will take away from my patient contact time
- [ ] I have difficulty determining PES statements
- [ ] I am concerned that the NCP will move my practice from individualised care plans to generalised care
- [ ] I am concerned that other health care professionals will not read the nutrition diagnosis (PES) statements
- [ ] I do not have any concerns about adopting the NCP and standardised language
- [ ] Other (please specify)

What are the current barriers to you implementing the NCP/IDNT (select all that applies)

- [ ] Lack of knowledge
- [ ] Time
- [ ] Resources
- [ ] Organisational constraints
- [ ] Training and support
- [ ] Other (please specify)

Click to write the question text

	Very Difficult	Difficult	Neutral	Easy	Very Easy
How difficult do you think implementation will be?	○	○	○	○	○

Block 5

Thank you for taking the time to complete the survey.

APPENDIX TWO

ASK NCP Survey and Participant Consent

Block 4

Evaluating the Implementation of Standardised Nutrition Language for Hospital Clinical Dietitians

Invitation To Participate

You are invited to take part in an Australian research project titled 'Evaluating the Implementation of Standardised Nutrition Language for Hospital Clinical Dietitians'. This research project is being undertaken as part of the requirements of a Masters of Public Health by Research at Edith Cowan University, School of Exercise, Biomedical and Health Science. If you have any questions or require any further information about the research project please contact Masters student Jane Porter (jmporter@our.ecu.edu.au), or supervisors Dr Therese O'Sullivan (t.osullivan@ecu.edu.au) / Dr Amanda Devine (a.devine@ecu.edu.au).

Description of Research Project

The Dietitians Association of Australia is advocating for Australian dietitians to adopt a standardised nutrition language, the International Dietetic Nutrition Terminology (IDNT). There is limited published information on the implementation and use of IDNT in dietetic practice, and no published Australian studies resulting in a lack of knowledge on how best to adopt it in Australia.
This study aims to evaluate dietitians knowledge, attitudes and readiness for the use of the IDNT pre and post implementation within a hospital department.

Your Involvement

You will be invited to complete an online questionnaire which should take approximately 20-25 minutes to complete. The questionnaire is anonymous.

Risks

There are no known risks associated with this study.

Benefits of Research

It is anticipated that this research will lead to an improved understanding of how to include the nutrition care process and IDNT in Australian dietetics practice. The results will inform recommendations on the future use and training requirements of the profession.

Confidentiality of Information

Your privacy and confidentiality about the information that is collected will be respected at all times. Any information released will be anonymous and for the purpose of reporting results only.

The results of this research project will be submitted as a Masters of Public Health by research thesis paper and peer reviewed journal article. All names and other identifying information will not be used.

Participation

Participation in this research study is voluntary. No explanation or justification is needed if you chose not to participate. You have the right to withdraw consent to further involvement in the project at any time without fear of prejudice or negative consequences.

Approval to Conduct This Research

This research project has been approved by the Edith Cowan University Human Research Ethics Committee (HREC approval number 5575). If you have any concerns or complaints about the research project and wish to talk to an independent person, you may contact:
Research Ethics Officer
Edith Cowan University
270 Joondalup Drive
Joondalup WA 6027
Phone +61 8 6304 2170
Email: research.ethics@ecu.edu.au

Consent

Click "yes" below to consent to participate in phase one of the project which involves completion of an online questionnaire.

I acknowledge that:

1. I have been provided with and understand the Information to Participate explaining the research
2. Have been given the opportunity to ask questions and can contact the research team at any stage in the project
3. I have been informed that I am free to withdraw from the project at any time without explanation or prejudice
4. The project is for the purpose of research
5. I have been informed that the confidentiality of the information I provide will be safeguarded and research data gathered may not be published provided my name or other identifying information is not used

To proceed with the questionnaire and provide your consent please click "yes" now.

- ○ Yes
- ○ No

By completing this survey your results wil be anonymous, and we will not be able to identify you in anyway. However, so that your answers in this survey can be linked with answers in upcoming surveys, while you still remain anonymous, we ask that you enter your own individual code.

The code will be:
- the first two letters of your mothers maiden name,
- the number of your home street address,
- the first letter of your fathers first name,
- the first letter of your fathers middle name, and
- the last number of your birth year.

For example, if your mothers name is Jane Doe, you live on 9 Brisbane Road, your fathers name is John Andrew Smith and you were born in 1980, your code would be: DO9JA0.

Reminder, this code will not be used to identify individual participants.

Your anonymous respondant code

The first two letters of your mothers maiden name	
The number of your home street address	
The first letter of your fathers first name	
The first letter of your fathers middle name	
The last number of your birth year	

Block 2

In completing this survey we acknowledge that you may not know all the answers to the questions, as we are evaluating awareness and knowledge to assist with development of the research project.

How many years have you been practicing as Dietitian

What is your gender

Where is your current place of work

What is your current work status?

Default Question Block

1. How strongly do you agree with the following statements?

	Strongly agree	Agree	Neither Agree nor Disagree	Disagree	Strongly Disagree
I am familiar with the American Dietetic Association Nutrition Care Process (NCP)					
I am familiar with the International Dietetic & Nutrition Terminology (IDNT)					
I am aware of the DAA recommendation to adopt the NCP and IDNT in Australia					

2. What is the first step in the Nutrition Care Process (NCP)

- Nutrition diagnosis
- Monitoring and evaluating
- Nutrition assessment
- Nutrition intervention
- Nutrition screening
- Don't know

The Nutrition Care Process Model

The Nutrition Care Process (NCP) is a systematic approach to providing high quality nutrition care. It provides a framework for dietitians to individualise care, taking into account patients needs and values using the best evidence available to make decisions.

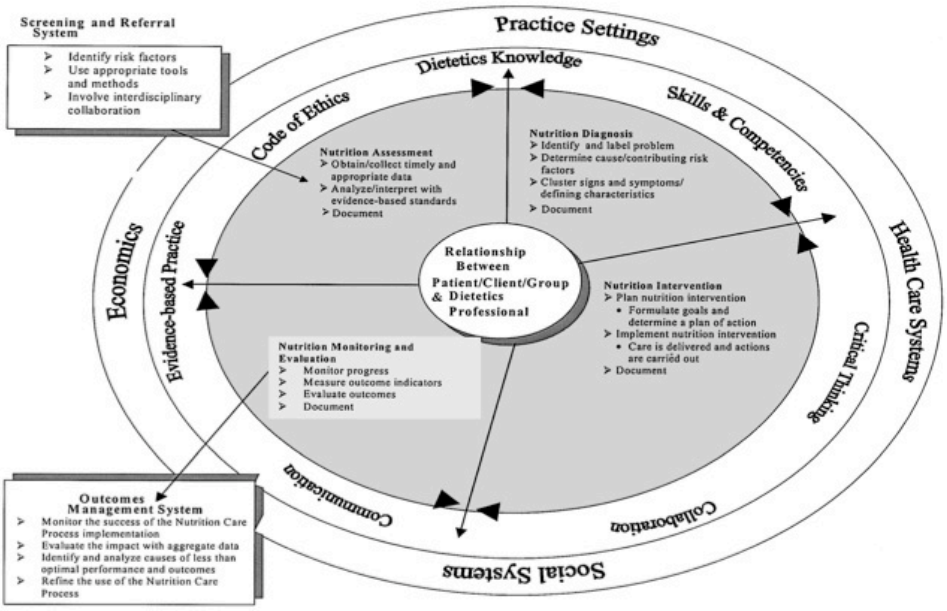


FIG 1. ADA Nutrition Care Process and Model.

International Dietetic and Nutrition Terminology (IDNT) is a standardised nutrition language which was developed in conjunction with the nutrition care process to describe the unique function of dietetics in

nutrition assessment, nutrition diagnosis, nutrition intervention and nutrition monitoring and evaluation.

3. Please rate the following statements:

	strongly agree	Agree	Unsure	Disagree	Strongly Disagree
The NCP and standardised language are applicable to my area of practice	○	○	○	○	○
I see the value of the NCP within my clinical practice	○	○	○	○	○
I see minimal benefit in changing my clinical documentation practice to incorporate the NCP	○	○	○	○	○
I see the value of IDNT within my clinical practice	○	○	○	○	○
I see minimal benefit in changing my clinical documentation practice to incorporate IDNT	○	○	○	○	○
I do not feel the need to change my clinical practice	○	○	○	○	○
I feel isolated from knowledgeable colleagues with whom to discuss the NCP/IDNT	○	○	○	○	○
I feel incorporating the NCP/IDNT will improve patient care	○	○	○	○	○

The following set of questions relates to your knowledge of the Nutrition Care Process and IDNT

4. Etiology is documented in which step of the Nutrition Care Process

- ○ Nutrition assessment
- ○ Nutrition diagnosis
- ○ Nutrition intervention
- ○ Nutrition monitoring & evaluation
- ○ Don't know

5. Which of the following is not a nutrition diagnosis

- ○ Excessive protein intake
- ○ Excessive carbohydrate intake
- ○ Dumping syndrome
- ○ Food & nutrition related knowledge deficit
- ○ Don't know

6. Which of the following terms is the standardised term to use when describing insufficient intake?

- ○ Poor intake
- ○ Not enough intake
- ○ Does not eat well
- ○ Inadequate intake
- ○ Don't know

7. Which of the following are the domains of the nutrition diagnosis in the NCP?

- ○ Food and/or nutrient delivery, nutrition education, nutrition counselling, coordination of nutrition care
- ○ Intake, clinical, behavioural/environment
- ○ Nutrition-related behavioural and environmental, food and nutrient intake, nutrition related physical signs and symptoms, nutrition related patient client centered
- ○ Food and nutrition, anthropometric, biochemical, medical and social diagnosis
- ○ Don't know

8. The connectors used in a PES statement are

- Related to, as evidenced by
- Due to, as evidenced by
- Related to, signs and symptoms
- Due to, signs and symptoms
- Don't know

9. The nutrition diagnostic term can be found in which portion of the PES statement

- Etiology
- Problem
- Signs & symptoms
- None of the above
- Don't know

10. Biochemisty values or weight status may be used in which part of the PES statement

- Problem
- Etiology
- Signs & symptoms
- Any of the above
- Don't know

11. Rate each question on a scale

	Very confident	Somewhat confident	Unsure	Not confident
How confident do you feel to implement the NCP into your own practice				
How confident do you feel to implement IDNT into your own practice				
How confident do you feel about identifying appropriate the most appropriate nutrition diagnosis				
How confident do you feel in writing problem etiology symptoms (PES) statements				

CASE STUDY

A 70 year old man (weight 60kg, height 170cm) who lives alone was diagnosed with heart failure 3 months ago. Since then he has has lost 12 kg from difficulty breathing (dyspnoea) and shortness of breath (SOB) and has difficulty consuming meals as he becomes tired easily. Assessing dietary intake was difficult. He can no longer shop or cook and he uses many foods which are packaged and high sodium for convenience.

Here are 2 possible PES statements:

A: Inadequate energy intake related to dyspnoea, SOB as evidenced by 12kg weight loss

B: Inadequate food and beverage intake related to inability to shop and cook as evidenced by 12kg weight loss in 3 months and reported early fatigue.

12. Choose the response that best describes the better choice of a PES statement and the best rationale for that choice

- A is preferred because dyspnoea and SOB is the true root cause of the nutrition diagnosis
- A is preferred because it is briefer and energy intake is more specific than food and beverage intake
- B is preferred because it provides specific signs and symptom related to the nutrition diagnosis
- B is preferred because the nutrition diagnosis is broader and encompasses the global problem that needs addressing

- Don't know

The following questions relate to your current practice

13. Please choose the statements that best applies to your current practice

- I am not currently using PES statements in my charting and I do not plan to use them
- I am not currently using PES statements in my charting but I intend to implement them within the next 6 months
- I am not currently using PES statements regularly but I will fully adopt them into my practice within 3-6 months
- I have incorporated PES statements into my charting and I have used them for less than 3 months
- I have incorporated PES statements into my charting and I have used them for 3-6 months
- I have incorporated PES statements into my charting for more than 6 months
- I have used PES statements in the past but I am not currently using them

14. Other than PES statements, have you implemented additional steps of the nutrition care process

- Yes
- No

15. If yes, please indicate which step(s) of the NCP you have incorporated into your charting (select all that applies)

- Assessment
- Intervention
- Monitoring and evaluation

16. Please rate the following

	Strongly agree	Agree	Unsure	Disagree	Strongly Disagree
Implementing the NCP/IDNT within my own practice is important to me					
Information on NCP/IDNT is readily available					
The implications of incorporating NCP/IDNT into practice is not clear					
There is support at my workplace to implement NCP/IDNT					
I have access to IDNT/NCP mentors					
Management is supportive of implementing NCP/IDNT					
My co-workers are supportive of using NCP/IDNT					
There is insufficient time on the job to implement new ideas such as NCP/IDNT					

17. Please rate the following

	Strongly agree	Agree	Unsure	Disagree	Strongly Disagree
NCP/IDNT interferes with my professional autonomy					
Generally I would prefer to continue my routine rather than change					
I don't have time to use NCP/IDNT					
Incorporating NCP/IDNT into my current practice will be inconvenient					

18. Which type of educational opportunities for NCP/IDNT have you participated in (select all that applies)

- Presentations

- [ ] Workshops
- [ ] Readings sent out by your department
- [ ] Department meetings
- [ ] Self directed readings
- [ ] Other, please specify

19. Please rate the following

	Strongly agree	Agree	Unsure	Disagree	Strongly Disagree
I have had sufficient training to feel knowledgeable about the NCP and IDNT	○	○	○	○	○
I have had sufficient training to feel comfortable implementing the NCP/IDNT into my practice	○	○	○	○	○
I require additional training specific to my area of practice	○	○	○	○	○

QLD only questions

The following questions relate to your experience of implementing NCP/IDNT within your workplace

20. Were there any challenges or barriers you have identified for implementation of the NCP/IDNT specific to your area of practice? If so please describe them

21. What tools/resources did you find most useful to facilitate incorporation of the NCP/IDNT into your practice?

22. What do you see as the key elements to successful implementation of the NCP and IDNT?

23. In hindsight, what if anything, would you have wanted done differently in the implementation of the NCP and IDNT?

WA only

The following questions relate to preparing for implementation of NCP/IDNT within your workplace

20. How prepared do you feel to implement NCP and IDNT within your workplace?

- ○ Very prepared
- ○ Somewhat prepared
- ○ Not very prepared
- ○ Not prepared at all

21. Do you feel with further training and support you will feel confident to implement NCP and IDNT within your work practice and use for clinical documentation?

- ○ Yes
- ○ Unsure

- [ ] No

22. What benefits do you anticipate will occur when you adopt the NCP and IDN into your practice (select all that apply)

- [ ] The NCP provides a consistent structure and framework for nutrition care
- [ ] Standardised language provides dietitians with a common vocabulary to identify nutrition problems
- [ ] It will allow more concise documentation
- [ ] It will allow for more consistent care when patients transfer services
- [ ] It will encourage critical thinking
- [ ] It will facilitate communication with other health care professionals
- [ ] It will assist in helping dietitians become recognised as more valuable team members
- [ ] It will improve patient care
- [ ] There are no benefits to adopting NCP/IDNT
- [ ] Other (please specify)

23. What are your main concerns about adopting NCP and IDNT into your practice (select all that apply)

- [ ] It will decrease my productivity during implementation
- [ ] I feel that the NCP will take away from my patient contact time
- [ ] I have difficulty determining PES statements
- [ ] I am concerned that the NCP will move my practice from individualised care plans to generalised care
- [ ] I am concerned that other health care professionals will not read the nutrition diagnosis (PES) statements
- [ ] I do not have any concerns about adopting the NCP and standardised language
- [ ] Other (please specify)

24. What are the current barriers to you implementing the NCP/IDNT (select all that applies)

- [ ] Lack of knowledge
- [ ] Time
- [ ] Resources
- [ ] Organisational constraints
- [ ] Training and support
- [ ] Other (please specify)

25.

	Very Difficult	Difficult	Neutral	Easy	Very Easy
How difficult do you think implementation will be?	○	○	○	○	○

Why?

26. What additional information do you require to implement the NCP and standardised language

27. Are there any tools or resources that should be developed to facilitate incorporation of the NCP and IDNT into your practice (eg quick reference sheets, manuals, policies, procedures etc)

Block 5

Thank you for taking the time to complete the survey.

APPENDIX THREE

Outline of NCP Implementation Package

Implementation Guide 2011

Overview of Implementation Process

The implementation manual has been developed for use by the site leadership group. It is not to be circulated to all staff. Resources are to be provided as indicated by the relevant stages and process.

This implementation manual has been developed to assist you and you're your team through the process of implementing the nutrition care process and standardised language for nutrition diagnosis within your workplace.

The manual has been developed as part of the research project titled "Evaluating the implementation of standardised nutrition language for hospital clinical dietitians", through Edith Cowan University, Joondalup.

Your department will receive full support from the researcher, Jane Porter AdvAPD, throughout the process. If additional resources/materials require development during implementation this will be coordinated by the researcher.

The implementation process has been set up in eight stages with progression after the completion of each stage. It is estimated this will take up to 6 months to complete.

The stages are:

- Stage 1: Establish a sense of urgency
- Stage 2: Create leadership group
- Stage 3 & Stage 4: Develop users and strategy, communicate
- Stage 5: Empower broad based action
- Stage 6 & Stage 7: Generate short term wins & consolidate gains and produce more change
- Stage 8: Institionalise new approaches

Timeframe Guide

The below is a guide for the length of time each stage may take. Please note this is a **guide only** and progression through will be site dependant.

	March	April	May	June	July
Stage 1					
Stage 2					
Stage 3&4					
Stage 5					
Stage 6&7					
Stage 8					ongoing

Communication

Below is an outline of the communication throughout the implementation period.

Key Contacts

Researcher: Jane Porter, jmporter@our.ecu.edu.au / 0428880304

SCGH site lead: TBA

SCGH leadership group: Melissa Edwin, Jedda Richardson, Gemma Gilbert, Cesarita Marzo

JHC site lead: Hayley Erickson

JHC leadership group: Hayley Erickson, Joo-Li Robertson, TBA

Communication

The researcher will have weekly contact with the site lead to discuss:

- Site implementation progress
- Issues arising/question/queries to feedback to staff

The leadership groups will have a face to face meeting during stage 5 however can maintain contact through a discussion forum which will be established. The researcher will moderate. This is for

- Support/queries regarding implementation
- Problem solving PES/nutrition diagnosis
- Collaboration on resource development

The staff at each site will have contact with members of the leadership group as the first point of call for queries. A discussion forum will be established for all staff from each site to communicate and problem solve PES and nutrition diagnosis.

Evaluating the Implementation of Standardised Nutrition Language for Hospital Clinical Dietitians

Implementation Guide 2011

Contents

Stage 1: Establish Sense of Urgency

Time Frame Guide

2 weeks

Process

Description	Resource	Comments
Department manager to direct all staff to watch DAA Webinar 1 and 2. Staff to inform manager once completed and manager to document on completion spreadsheet.	Presentation: DAA webinar 1 Presentation: DAA webinar 2 Completion spreadsheet	The webinar links are provided to staff by the department manager to watch. The spreadsheet details all staff members and is a record for the manager that they have completed items as directed.
Department manager to direct staff to read supplied articles. Staff to inform manager once completed and manager to document on compliance spreadsheet	Article: Nutrition care process and model part 1. Article: Nutrition care process part 2	The articles are electronic and forwarded to the staff by the manager to read.

On completion

Once completed, forward completion spreadsheet to researcher for record keeping.

Move onto stage 2.

Stage 2: Create Leadership Group

Time Frame Guide

1 week

Process

Description	Resource	Comments
Department manager to create leadership team	N/A	
Leadership group to develop department vision for implementation of NCP/IDNT	N/A	Leadership group to meet to workshop a draft vision. Vision to be a simple statement for the department. Will be work-shopped with all staff as part of Stage 3
Leadership group to establish a whole of department meeting time for presentation 1 to be delivered by researcher	N/A	Allow 1 hour for the first presentation and questions
Leadership group to determine dates for presentation 2 (1 week post presentation 1), peer learning groups (of 3-4 staff members) and fortnightly staff meetings to commence	N/A	Dates are to be submitted to Researcher.

On completion

Once completed, inform researcher of the leadership group and key dates.

Move onto stage 3.

Stage 3: Develop users and strategy &

Stage 4: Communicate

Time Frame Guide

2 weeks

Process

Description	Resource	Comments
Presentation held with whole of department. Presented by researcher and leadership group	Presentation 1 (1 hour duration)	Presentation is in powerpoint format and provided to the leadership team as part of the implementation package. The presentation will finalise department vision, overview implementation strategies and communication, workshop department benefits of NCP and IDNT.
Leadership group to establish date for presentation 2 (1 week post presentation 1)	N/A	
Leadership group to determine dates for commencement of peer learning groups and fortnightly staff meetings	N/A	

On completion

Once completed, leadership group to communicate department vision, benefits and key dates to researcher.

Move onto stage 5.

Stage 5: Empower broad based action

Time Frame Guide

3 months

Process

Description	Resource	Comments
Representative from leadership group to maintain weekly contact with the Researcher	N/A	Time and dates to be established
Presentation held with whole of department	Presentation 2 (1.5 hours duration) by researcher Worksheet 1: Practicing PES statements Worksheet 2: Evaluating your PES statements Worksheet 3: Problem etiology matrix Book: Nutrition diagnosis pocket guide	Presentation is in powerpoint format and provided to the leadership team as part of the implementation package. Will cover in detail PES statements, how to write them, how to evaluate them, practice sessions. Worksheet 1, 2 and 3 provided in the manual are distributed by the leadership team to be used for the activities embedded in the presentation. Nutrition diagnosis pocket guide is provided to each staff member by the leadership group.
Peer learning groups created and commence weekly working groups	Process 1: Peer learning groups Worksheet 4: Peer learning group PES	Process 1 is a guide for the leadership group regarding how to conduct peer

	statements Worksheet 2: Evaluating your PES statements Book: Nutrition diagnosis pocket guide	learning groups. Peer learning groups to be ongoing. Leadership group members to attend 1 peer group each. Worksheet 4 provided in the manual is given to the peer learning groups by the leadership group.
Fortnightly whole of department meetings to commence	Process 2: Fortnightly department meeting Leadership group tool 1: Sample PES statements	To discuss case studies and PES statements. Leadership group tool 1 is an electronic document with sample PES statements for the leadership group to develop and continue expanding sample PES Statements with team approved examples. Not for distribution to staff at this stage
Email discussion groups to be formed.	Leadership group email discussion forum Pilot sites discussion forum	One for leadership groups from each site to communicate and one for all staff to communicate and problem solve PES statements
Leadership group from both sites to meet with research lead to discuss progress, collaborate and problem solve nutrition diagnosis situations	N/A	To be completed after 1 month of peer learning group activity.

Commence documentation of PES in medical records. Set up a buddy system within peer learning groups for support		Leadership group will advise staff when they may commence documentation of PES in medical records. Anticipated this phase will commence ~2 months after practicing. Buddy is available for advice when staff are on the wards and is determined by the leadership group.
All staff to submit 5 PES statements to a representative of the leadership group per week.	Worksheet 2: Evaluating your PES statements	This is not a formal evaluation phase but used as a feedback mechanism to identify areas for continual improvement or that need further work shopping. The leadership group provide staff with the worksheet from the manual and direct completion.

On completion

Move onto stage 6 & 7.

Stage 6: Generate Short term wins &

Stage 7: Consolidate gains and produce more change

Time Frame Guide

2 weeks

Process

Description	Resource	Comments
Presentation held with whole of department by leadership group and researcher	Presentation 3 (45minutes)	Presentation is in powerpoint format and provided to the leadership team as part of the implementation package. Purpose is to overview how department is going with PES, reflect and identify areas of further improvement. Celebrate all that has been achieved to date and workshop what department guidelines and materials need to be formalised in the department
Leadership group reviews documentation system (SOAP vs ADIME) and develops trial assessment form to aid documentation review	Leadership group resource: samples of ADIME nutrition assessment forms	Leadership group to develop trial assessment form. Samples of ADIME assessment forms are provided in the manual as a reference for the

		leadership group.
Presentation by researcher held with whole of department to outline new documentation process and provide education	Presentation 4 Process: ADIME documentation	Presentation is in powerpoint format and provided to the leadership team as part of the implementation package. Purpose is to present trial form and educate on how to document using ADIME

On completion

On completion, provide presentation and trial form to researcher. In addition provide feedback on identified department specific guidelines and materials that need to be reviewed/developed.

Move onto stage 8.

Stage 8: Institutionalise new approaches

Time Frame guide

Ongoing

Process

Description	Resource	Comments
Department manager to oversee and determine policies and procedures to be changed. Staff are allocated tasks	Nil	
Chart audits to commence	Worksheet: Worksheet	Sample chart audits provided to leadership group as part of the manual.
Orientation program and competency to be reviewed		
Peer learning groups and staff reflection to remain ongoing.		Consider peer learning groups going to fortnightly and department reflection to monthly

APPENDIX FOUR

Manuscript entitled ‘Development of a Nutrition Care Process Implementation Package for Australian Hospital Dietetic Departments’ statements of contribution

To Whom It May Concern:

I, Jane Porter, contributed to the conceptualisation and design, implementation, data analysis and interpretation, and writing the paper entitled *Development of a Nutrition Care Process Implementation Package for Hospital Dietetic Departments*.

I, as a Co-Author, endorse that this level of contribution by the candidate indicated above is appropriate.

	Signature	Affiliation	Date
Dr Amanda Devine		Edith Cowan University	
Dr Maree Ferguson		Princess Alexandra Hospital	
Dr Angela Vivanti		Princess Alexandra Hospital	
Dr Therese O'Sullivan		Edith Cowan University	22/7/14

To Whom It May Concern:

I, Jane Porter, contributed to the conceptualisation and design, implementation, data analysis and interpretation, and writing the paper entitled *Development of a Nutrition Care Process Implementation Package for Hospital Dietetic Departments*.

I, as a Co-Author, endorse that this level of contribution by the candidate indicated above is appropriate.

	Signature	Affiliation	Date
Dr Amanda Devine		Edith Cowan University	
Dr Maree Ferguson		Princess Alexandra Hospital	8/7/14
Dr Angela Vivanti		Princess Alexandra Hospital	
Dr Therese O'Sullivan		Edith Cowan University	

To Whom It May Concern:

I, Jane Porter, contributed to the conceptualisation and design, implementation, data analysis and interpretation, and writing the paper entitled *Development of a Nutrition Care Process Implementation Package for Hospital Dietetic Departments*.

I, as a Co-Author, endorse that this level of contribution by the candidate indicated above is appropriate.

	Signature	Affiliation	Date
Dr Amanda Devine		Edith Cowan University	
Dr Maree Ferguson		Princess Alexandra Hospital	
Dr Angela Vivanti		Princess Alexandra Hospital	7 July 2014
Dr Therese O'Sullivan		Edith Cowan University	

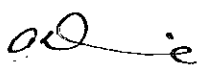
APPENDIX FIVE

Manuscript entitled ‘Evaluation of a Nutrition Care Process Implementation Package in Australian Hospital Dietetic Departments’ statement of contribution

To Whom It May Concern:

I, Jane Porter, contributed to the conceptualisation and design, implementation, data analysis and interpretation, and writing the paper entitled *Evaluation of a Nutrition Care Process Implementation Package in Australian Hospital Dietetic Departments*.

I, as a Co-Author, endorse that this level of contribution by the candidate indicated above is appropriate.

	Signature	Affiliation	Date
Dr Amanda Devine		Edith Cowan University	22/7/14
Dr Therese O'Sullivan		Edith Cowan University	22/7/14

APPENDIX SIX

Focus Group Questions

Focus Group Questions and Key Themes Identified

	Question	**Responses (Keywords/Phrase)**
The following questions relate to the implementation package and its materials		
1.	How useful was the implementation package	Very Evaluating your PES was useful Sample case studies good Led what to do when Use on new staff and students
2.	Which component of the implementation package was most helpful	Nutrition diagnosis book Presentations Main contact on site, supervision Actual resource manual
3.	Which component of the implementation package as least helpful	Email group spreadsheet
4.	Do you have any suggested changes to the implementation package	Tabs in the book Case studies and answers Peer groups in electronic format Cheat sheet earlier in the package
5.	Would you recommend the implementation package to other departments	Yes
The following questions relate to implementation of NCP within the department		
6.	Did the implementation process assist you with your understanding of NCP and IDNT. If yes, how did it assist	Yes Direct to resources Knowing context – why Peer groups and resources
7.	What was the most important key element	Peer groups, discussions

	to successful implementation	No criticism, Someone on site to drive it Submitting PES statements Structure
8.	What do you feel were the barriers to successful implementation	Time – to participate Time- for part time staff
9.	What would you require to assist you to continue implementation of NCP and IDNT	- support from other sites more focus on ADIME process continue groups - forum to submit PES in a format and get comments, discussion complex tertiary case studies
10.	Are you happy to continue using the NCP and IDNT	Yes