



# **FAST-TRACK (Enhanced Recovery Program) in Colorectal Surgery**

## **A Literature Review**

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<p><b>Abstract:</b></p> <p><b>Objective</b> This study aims at employing a literature review of benefits of fast-track / enhanced recovery program after colorectal surgery.</p> <p><b>Method</b> This is a qualitative literature review study. 10 researched articles were reviewed. Additionally reviewed and included in the study was 2 fast-track protocol guidelines. The inductive content analysis method was used to analyze and provide answers to the research questions.</p> <p><b>Research questions</b></p> <ol style="list-style-type: none"> <li>What are the benefits of fast track colorectal surgery?</li> <li>What are patients' views on fast-track program?</li> </ol> <p><b>Results</b> Results suggested that fast-track program in colorectal surgery reduce complications such as infections, morbidity, mortality, gut function, pain, length of stay without compromising patient safety, cost reduction and also patients felt involved in the program.</p> <p><b>Conclusion</b> Fast-track protocols should be considered in other surgical procedures as it has proved to work effectively in colon surgery. More future researches and awareness should be conducted on patient views and feelings. Health care staff should be more and frequently educated about the program since it is still a new approach. Need for care emphasis on postoperative patients as one way to improve fast track protocol strategies.</p>	
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## FOREWORD

Before you lies the thesis ``First - track (enhanced recovery program) in colorectal surgery: A qualitative literature review'', conducted from academic journal articles dating as far back as 2000 to 2014 respectively. It has been written to fulfill graduation requirements of Bachelor of Health Care in Arcada University of Applied Sciences. My role was to research and write this thesis during my studies.

My research work background and plan was formulated with the help of my supervisor, Gun-Britt Lejonqvist who always took time for me and foresaw my ambition, interests and encouraged me to follow what I believed in best whilst giving me her utmost experience and mentorship in this research study. Conducting extensive literature review from many different sources such as academic journal articles, scientific and philosophical books, frequent library visitations, referrals and internet resources made it easier to get answers to the research questions.

I would like to thank and give my deepest appreciation to my examiner and tutor, Pamela Gray for her excellent guidance, and support throughout the time of writing this thesis and without whose cooperation and feedback I would not have been able to have the concrete knowledge in thesis researching and writing I have today.

My family deserve a note of gratitude: Your wisdom, love, and motivation has always been a backbone in my life. To Lauri: Thank you for the abundant resources and support. Last but not least, I would like to give special thanks to Arcada for the wonderful opportunity for acquisition of knowledge, resources and skills.

I hope you enjoy reading this thesis.

Vivian Mwangi

Helsinki, December 07<sup>th</sup>, 2015.

# 1 INTRODUCTION

Colorectal surgery is a field in medicine, dealing with disorders of the colon, rectum, and anus. These colorectal surgical disorders can range from and include: Hemorrhoids; anal fissures; fistulas; severe constipation; fecal incontinence; rectal prolapse; Crohn's disease; colorectal cancer; anal cancer; and any other anal injuries (Wikipedia 2015). These surgeries tend to give stress to the patients' wellbeing. Henceforth the introduction of Fast track surgery/ Multimodal care/ or Enhanced recovery after surgery. Fast track or Enhanced recovery after surgery protocols are gaining popularity in order to modify surgical stress responses (Kahokehr 2009). Author will mainly be using fast track surgery term in this study.

Fast track surgery is a specific perioperative procedure. Its aim is to reduce the number of complications, to improve the comfort and satisfaction of treated patients and to shorten the time of their hospital stay (Sosada et al. 2012). Organization and effectiveness of a fast-track protocol requires participation and commitment from a multidisciplinary team, including surgeons, anesthesiologists, nursing staff, social services and hospital administration (Ricciardi & Mackay 2015).

Fast-track program is one of the recent changes in health care towards standardized evidence-based practices, decrease of hospitalization and increase of patient involvement. Medical research has documented that postoperative recovery can be accelerated and that hospitalization can be reduced through fast-track programs (Kehlet 2008; Fearon et al. 2005; Wind et al. 2006). Fast-track program was developed in the end 1990s by Henrik Kehlet who pioneered the concepts of using protocols for colorectal surgical patients during hospital admission so as to shorten the amount of admission days versus the traditional 7 days at the time. The subchapter below discuss about fast-track history.

## 1.1 Background

Fast track surgery has been introduced and pioneered from the end of 1990s by Professor Henrik Kehlet, a colorectal surgeon from Hvidovre University Hospital in Denmark. Together with his group he achieved a median postoperative hospital stay of two days in

open colectomy patients treated in fast track surgery compared to generally accept post-operative hospital stay of seven to ten days in most centers at the time (Kehlet 1997). This multimodal rehabilitation program developed by Henrik Kehlet combines several interventions and goals which are directly targeted at reducing surgical stress through integrated preoperative, intraoperative, and post-operative pathways such as avoidance of bowel preparations and drains, fasting, and the inclusion of carbohydrate fluids before surgery, pre-emptive treatment of postoperative pain and nausea, regional anesthetic procedures, and active patient mobilization (Kehlet & Wilmore 2005).

The strategy of fast track gathers various elements of perioperative procedures. It takes into account the pathophysiology of operation injury and eliminates surgical procedures that are not justified in the perspective of evidence-based medicine. Optimal preparation of a patient for the operation connected with oral and written information about the surgical procedure and postoperative course, early feeding and rehabilitation on the day of surgery and optimal pain control make up the most important elements of pre and post-operative procedures based on fast track surgery. Intraoperative factors include minimal-access surgery, thoracic epidural anesthesia and non-routine use of nasogastric tubes and abdominal drain. (Sosada et al. 2012).

These procedure result to short hospital stays, cost reductions, decrease in postoperative complications, and patients' comfort and satisfaction (Kehlet & Wilmore 2008). Discharge criteria with fast-track surgery are similar to those of traditional care, but fast-track programs meet the discharge criteria sooner (Kehlet & Wilmore 2005).

Today, patients who have undergone colonic surgery are discharged two to three days after open surgery compared with seven to ten days previously (Kehlet & Mogensen 1999; Basse et al. 2001). Fast-track programs implementation is increasing and spreading worldwide and several researches and studies have documented their benefits. Organ functions, muscle mass, strength and physical performance are not deteriorated compared with the preoperative level (Basse et al. 2002; Kehlet & Dahl 2003; Folkersen et al. 2005).



## **1.2 Fast-track concepts**

Fast track surgery protocols (Figure 1) constitute theories of evidence based techniques to reduce surgical stress and hospital length of stay as stipulated in the introduction. (Shakeeb et al. 2009; Best Practice in General Surgery website 2014), discusses that these evidence based fast track protocols can be categorized into: Preoperative strategy; Intraoperative strategy; and Post operatives' strategy.

### **Preoperative strategy**

The guidelines for preoperative protocol care comprise of adequate counselling and training where verbal and written information should be addressed to patient by not only the surgical team but also by other health professionals such as stoma and nutrition nurses, physiotherapists, dieticians etc. The information on Fast track such as what is it and its components and implementations; what patients should expect; clear and specific instructions should be given about mobilization, early introduction of diet and active patient participation goals set; information on smoking cessation; approximate length of stay; early ambulation; pain control; gum chewing; postoperative feeding or ileus; and time of catheter removal etc., should be provided to facilitate patients' education (BPGS 2014; Shakeeb et al. 2009).

Fasting for 8 hours before surgery has been known to be normal surgical practice, but with fast track program, a patient should only be fasted to 6 hours solids but can be allowed clear free liquids up to 2 hours before surgery as it is safe, acceptable to patients, minimizes thirst and improves post-operative wellbeing of patient. Antibiotics covering both aerobic and anaerobic organisms should be administered prior to incising the skin as this reduces the rates of wound infection after surgery. Deep vein thrombosis prophylaxis such as lower weight heparin etc., should be used as this lowers the risk of bleeding complications and is easy to administer (Shakeeb et al. 2009).

### **Intraoperative strategy**

In the intraoperative protocol care, (BPIGS 2014) guideline state that the patients should have a goal directed fluid management. Minimal invasive methods of optimizing fluid balance should be used as they play a role in enhancing post-operative recovery return of

gut function and sepsis measures. It is recommended to avoid the use of prophylactic use of nasogastric tubes which can lead to increase in pulmonary complication and fever which might prolong hospital stay; and also prophylactic abdominal drains as they might be painful, cause discomfort, and can make post-operative mobilization difficult (Shakeeb et al. 2009).

### **Post-operative strategy**

Provided that the patient is alert, awake, and capable of swallowing, then enteral feeding (oral fluids) should be allowed on the day the/after the surgery, and a regular diet depending on how much the patient can consume should be encouraged from beginning of post-operative day one. Secondly, the postoperative fluid management; post-surgery, fluid volume should be measured prior to fluid boluses administration putting in consideration of both heart rate, mental status of the patient, low urine output and low blood pressure as well as this might help to avoid sodium overload, hyperchloremic acidosis and gut function return delay (Shakeeb et al. 2009; BPGS 2014).

The thirdly is early mobilization; patients should be encouraged to practice early on movements at least four to six hours per day, eat while sitting on a chair, and dangle their legs on the day of surgery. Fourthly is the emphasis on chewing gum to reduce postoperative ileus at least five minutes each time more than 3 times per day. The sixth one is the optimal duration of urinary drainage; for low colorectal surgery patients, catheters should be removed within 72 hours after surgery or within twenty four hours if undergoing colon resection but this does not apply if catheter is used for monitoring purposes (BPGS 2014).

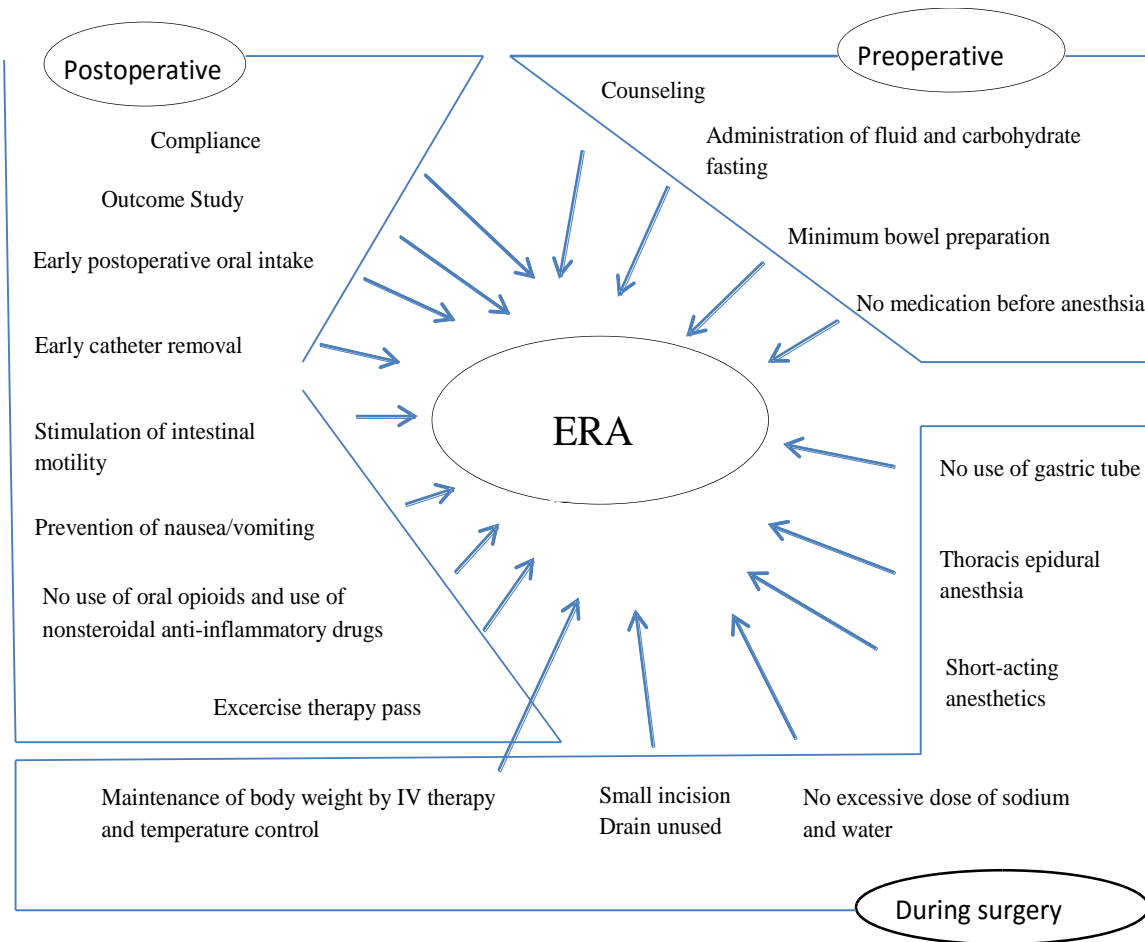


Figure 1. Guidelines for Implementation of Enhanced Recovery Protocols (Shakeeb et al. 2009)

## 2 THEORETICAL FRAMEWORK

Theoretical framework is a framework that gives a study its structure, acts as a frame of reference, guides, directs the study and helps make meaningful interpretation of the study (Thompson 2014). The author chose a theory called Virginia Henderson's Nursing need to act as a structurally guideline this study research.

## **2.1 Virginia Henderson's Nursing Need Theory**

Selecting an appropriate conceptual model or theoretical framework is an important step in research development because it provides a pattern of reasoning to guide the research (Mock et al. 2007). Virginia Henderson's Nursing Theory Need was adopted for this study because it includes concepts that are the basis and potential interventions for the increase in patient's independence in order to fasten their progress in the hospital. It also supports, works hand in hand with and initiates the fast track recovery in the colorectal surgical patients on a nurse's perspective (Henderson 1966). The theory comprises of assumptions, 14 components and 4 major concepts. The journal articles reviewed and used in this study research support the theory, its concept and linkages, and demonstrate its usefulness as a framework for the investigation of the benefits of fast track program in colorectal surgical patients.

The Need Theory emphasizes on the importance of increasing the patient's independence and focus on the basic human needs so that progress after hospitalization would not be delayed (Vera 2014). This subsequently leads to the 4 major concepts underlying this theory proposed by Henderson namely individual, environment, and health and nursing (Vera 2014).

The individual concept assumes that individuals have 14 basic needs shown in figure 2, that are components of health and require assistance to achieve health and independence, which basically means that an individual achieves wholeness by maintaining physiological and emotional balance (Vera 2014). Whereas the environment concept talks about maintaining a supportive environment conducive for health such as maintaining asepsis, air movement, light, temperature, appropriate disposal of waste etc. . According to Virginia Henderson's nurse need theory, if nurse and patient transaction is formed which will result to good communication, mutual understanding, respect and trust, then mutual goal-setting will occur for better health. Health concept meant maintaining balance in all realms of life without aid in the 14 components of basic human needs (Vera 2014). This is contributed by nurses whose primary roles are to promote health, illness prevention, alleviate suffering and pain (Berner 1984).

And the last concept being nursing. The nurse's main goal is to play roles as a substitute, doing something for the patient; supplementary, helping the patient do something; and/or

complementary, working with patient to do something in order to make a patient complete and independent by collaborating with necessary hospital staff and physicians. Nurses temporarily assist an individual who lacks the necessary strength, will, and knowledge to satisfy one or more of the 14 basic needs (Vera 2014). “The nurse is temporarily the consciousness of the unconscious, the love life for the suicidal, the leg of the amputee, the eyes of the newly blind, a means of locomotion for the infant, knowledge and confidence of the young mother, the mouthpiece for those too weak or withdrawn to speak” (Henderson 1966).

Henderson states that “the nurse does for others what they would do for themselves if they had the strength, the will, and the knowledge”. But (Vera 2014) adds that the nurse makes the patient independent of him or her as soon as possible. These four concepts form mutual importance and link to one another.

# 14 Components of Virginia Henderson's Need Theory

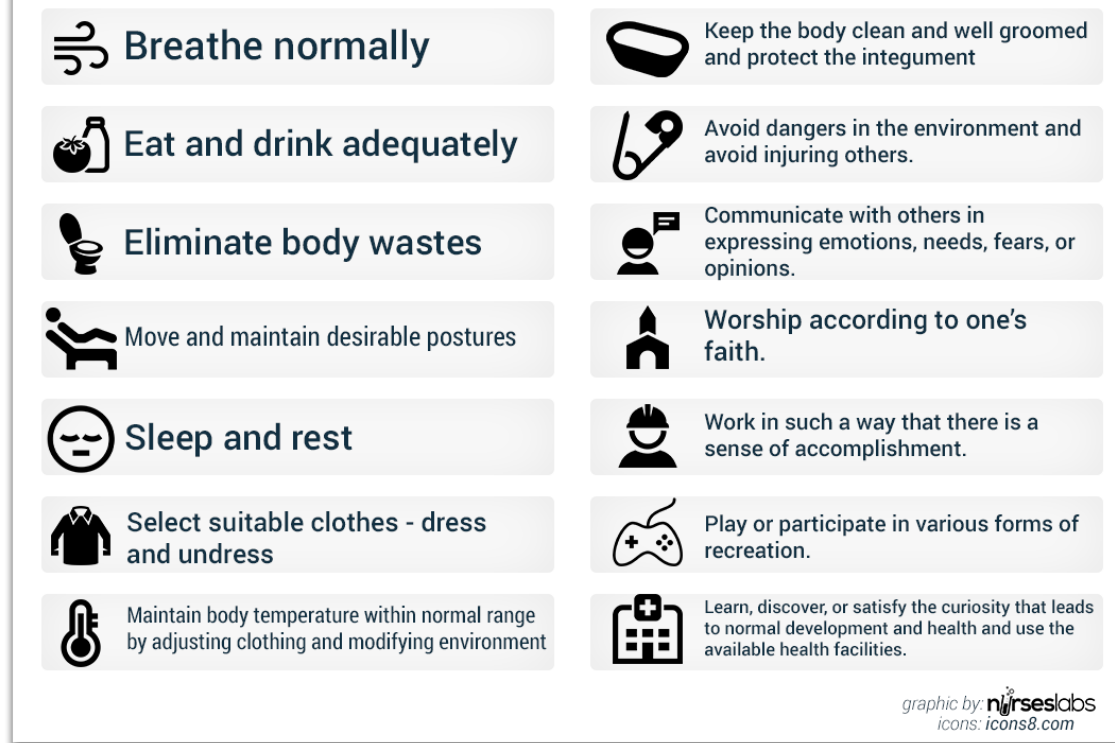


Figure 2. Components of Virginia Henderson's Need Theory (Vera 2014)

According to Henderson (1966) these components can be divided into 4 categories where the nurse's presence and assistance to an individual plays role:

## Physiological Components

The physiological category is if a patient is able to breathe normally; eat and drink adequately; has a healthy digestive system hence can also eliminate waste; ability to mobility; maintains an optimum range of body temperature; is able to perform and maintain self-hygiene and is conscious enough to avoid physical dangers to self and others.

## **Psychological Aspects of Communicating and Learning**

The patient in this case shows the ability to express themselves regarding their emotions, fears and opinions. They are able to learn, discover and hence cognitive skills development results. Where there is development, health will be behind it. The patient is also able to use healthcare facilities when he sees fit and/or feels unwell.

## **Spiritual and Moral**

This is whereby the patient is free to choose to worship or have faith in any kind of religion, no religion or/and any higher force so long as the good moral deeds are performed. It means that a patient knows good and bad and is able to differentiate the two.

## **Sociologically Oriented to Occupation and Recreation**

The patient is able to have a normal work life, feel self-worth and achievement in doing so. Also to be able to integrate in the community is seen as one form to achieve good health.

## **2.2 Using the Nursing Need Theory to guide the study**

In order to check for similarities the author then used the theory to compare and guide the study as shown and discussed below where relationship between the concepts of Nurse Need Theory, nursing process, roles and interaction that help in achieving better health are in perspective.

Figure 3 shows the initial first step relationship between the nurse and patient aspects. The figure shows that the nurse and client interact and are surrounded by environment (cleanliness, asepsis, healthy psychological interactions etc.). This means that if a good interaction is initiated in a conducive environment by the nurse so as to make the patient have trust in him/her, then better health outcomes will result. A good mutual nurse/client interaction will result in better health care provision, health care plan construction & follow up, and attainment. *“The nurse is expected to carry out a physician’s therapeutic plan, but individualized care is result of the nurse’s creativity in planning for care.”* (Henderson 1966).

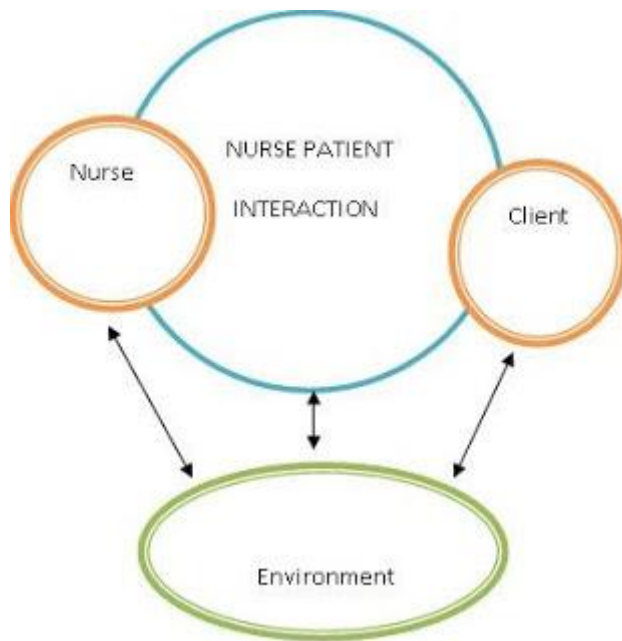


Figure 3. Interaction between concepts (Vera 2014)

The nurses need to be advocates, educators and a go to person when a client needs help or is seeking for information. In this study, the fast track preoperative protocol guideline stated earlier on in this study that there need to be counselling intended to the client, this may be done by the nurse through assurance, educating, informing and creating trust. This mainly happens in the initial stage before the surgery when a client need all the information about the surgical procedure before in and after, education and questions be answered to him/her. And it is a nurse's job to make this possible. Once the mutual bond has been created then the nursing process and entire hospitalization will yield better outcomes for both the nurse and client as shown in (figures 4 & 5) below.

*“The unique function of the nurse is to assist the individual, sick or well, in the performance of those activities contributing to health or its recovery that he would perform unaided if he had the necessary strength, will or knowledge. And to do this in such a way as to help him gain independence as rapidly as possible.”* (Henderson 1966).

As (figure 5) shows, the nurse's role and influence continues by assisting and supporting the client. The figure shows the nurse's role as a substitute, a supplementary and /or complimentary.



“To get inside the patient’s skin and supplement his strength, will or knowledge according to his needs.” (Henderson 1966). This means that throughout the whole surgical procedure and hospitalization, the nurse will have to assist with or without the help of the client him/herself. This includes administering medication, performing the 14 basic human needs stipulated by Henderson, partial or without client’s help.

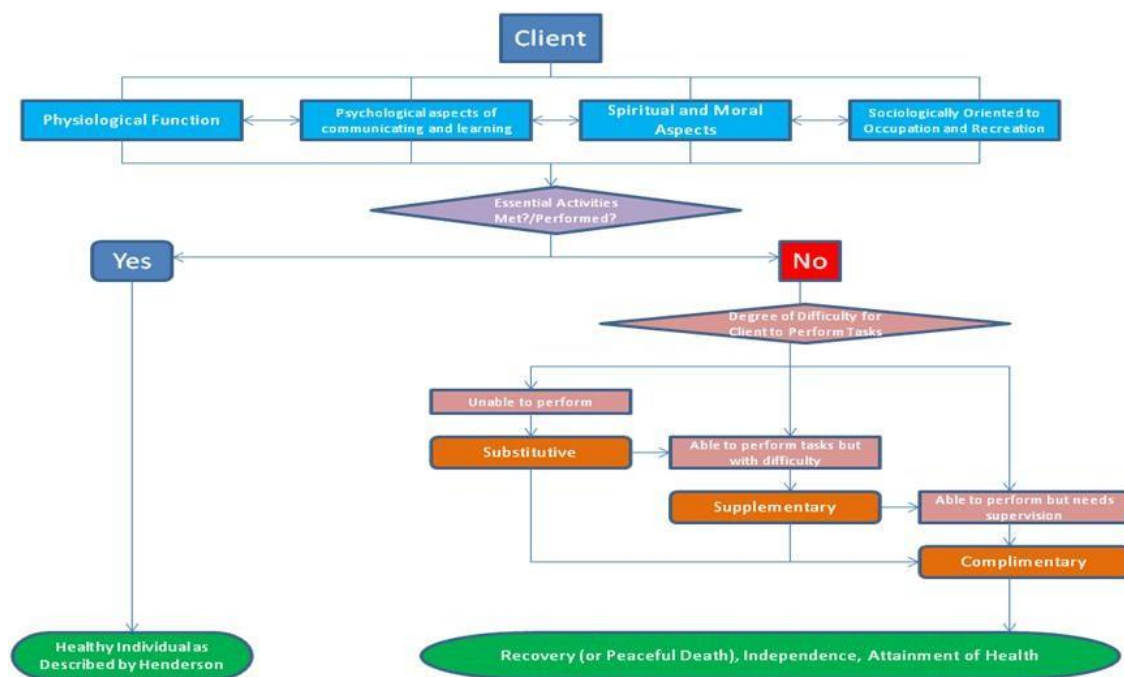


Figure 4. Explanation of conceptual nursing process in the Nurse Need theory (Mercado 2011)

Figure 5 elaborates the relation between the nurse, client, environment and nursing. After the colorectal surgery with aid of fast track protocols, the patient will or will not have full power to do some of the activities such as the basic human needs, will need assistance, support and/or will not be able to tend to him/herself due to restriction in movement, unconsciousness etc. Henceforth it will be the role of the nurse to find those needs and difficulties and tend to them including the therapeutic plan by the physician. Once the nurse has identified the needs, she would need to make a nursing care plan that will help her in making a follow up on the patient and make sure the needs have been met and

tended to in order for the that individual to achieve the goal set and that is, independency and henceforth better health in the long run.

*“The nurse should be an independent practitioner able to make independent judgement. The nurse has the responsibility to assess the needs of the patient, help him or her meet health needs, and provide an environment in which the patient can perform activity un-aided.” (Vera 2014).*

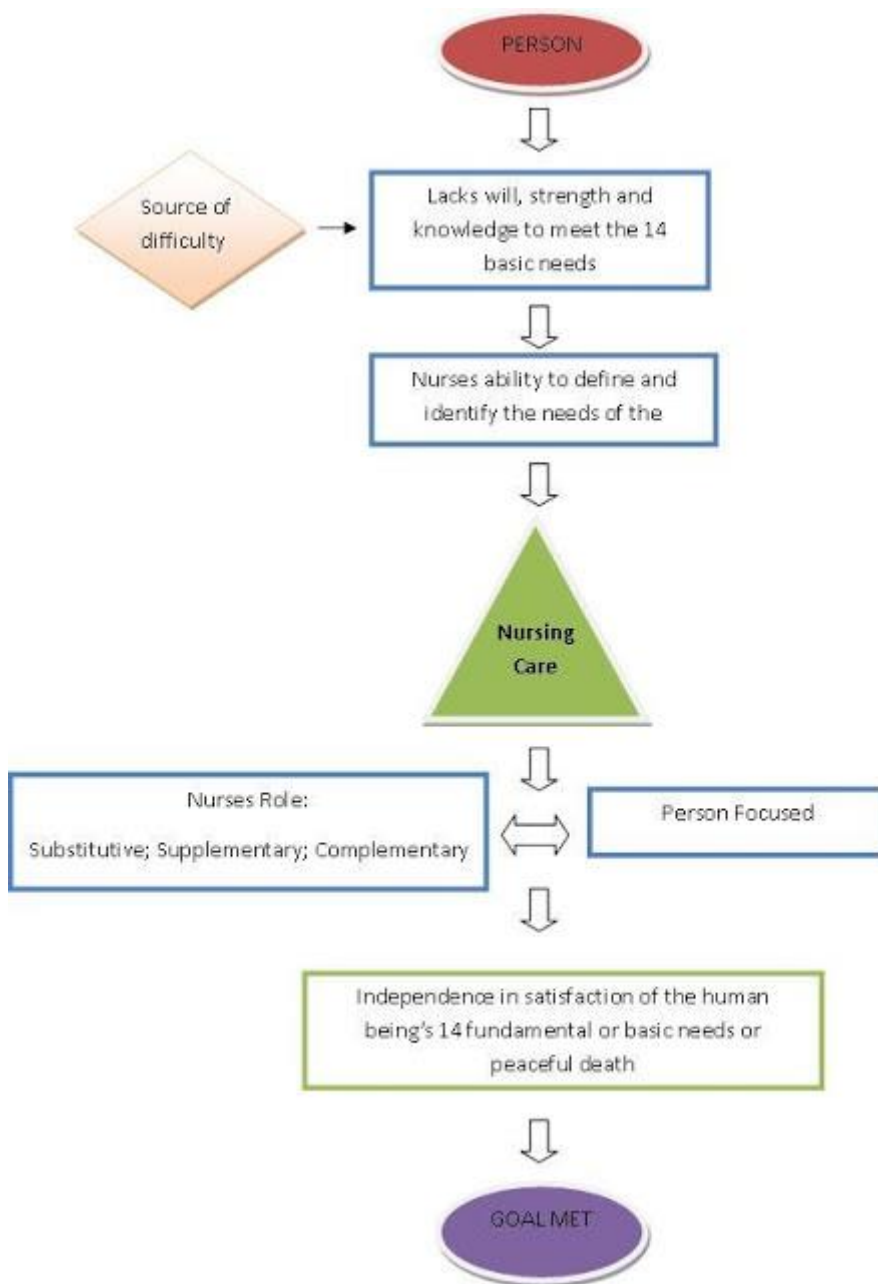


Figure 5. Concepts and nursing interaction (Vera 2011)

### **3 AIM AND RESEARCH QUESTIONS**

The aim of this study is to do a qualitative literature review research on fast track or enhanced recovery program on patients who have undergone colorectal surgery in order to provide answers for the research questions below:

- 1) What are the benefits of fast track colorectal surgery?
- 2) What are patients' views on fast track program?

### **4 METHODOLOGY**

Methodology is the general research strategy that outlines the way in which a research project is to be undertaken and, among other things, identifies the methods to be used in it. These methods, described in the methodology, define the means or modes of data collection or, sometimes, how a specific result is to be calculated, (Howell 2013). ). In this instance the author of this study's ideal approach interest was to do research on how nurses' roles can be of importance and how they can be involved in surgical procedures. Hence the author thereafter opted for a literature review of nursing journals and articles in fast-track colorectal surgery. The method of analysis employed in the research study was through qualitative content analysis of the articles obtained from trustworthy scholarly search engine with fast-track, colorectal surgery and enhance recovery as the main keywords. These articles and journals were obtained as secondary data during the search, meaning that the author obtained them from other researchers through literature reviewing.

Research method refers to the way the researcher collects data, whether by observation, questioning, or measuring. The author thoroughly qualitatively reviewed the articles from EBSCO search engine and thereafter decided to base on researching for the benefits of fast-track in colorectal surgery with regard to nurses' roles and opinions of patients who have undergone fast-track colorectal surgery, meaning how they generally felt with fast-track. The method of data collection is related both to the problem being studied and to the research design (Seaman et al. 1982).

## **4.1 Literature review**

A literature review is a systematic, explicit, and reproducible method for identifying, evaluating, and synthesizing the existing body of completed and recorded work produced by researchers, scholars, and practitioners (Fink 2005). The author thoroughly read through each of the secondary data from articles whilst making notes in between of the important factors obtained. The main focus of the analysis of the articles were what were they researching on, how they were conducted/methods, criteria used, interventions and results which had to evidence-based show how fast track helped. It is a critical appraisal of other research on a given topic that helps to put that topic in context (Machi et al. 2009).

## **4.2 Data collection**

According to (Machi et al. 2009), the literature review model is comprised of six steps. The first step is selecting a research topic of interest in a practical problem; in this case Fast-Track in Colorectal Surgery: A Qualitative literature review. The study selections' aim was to identify articles that informed about the patient outcomes and benefits of fast-track program hence the seven random controlled trials and three systematic reviews were included in the reviewing criteria. Second step is searching the literature by means of skimming, scanning, and mapping the data and then catalog and document the relevant data found; the author searched study articles through academic search elite (EBSCO) from January 2000 to October 2014 with fast track as the first key word, which then yielded 636 study articles. Thereafter a thorough search with more keywords that is, colorectal and surgery were initiated and then the search yielded 49 articles which upon closer and thorough evaluation, 10 articles that were corresponding with the research questions were deemed right and necessary. The author found 2 fast-track protocol guidelines from articles' references that were also included in this study. The 2 guidelines are from (Shakeeb et al. 2009) and best practice in general surgery (BPGS 2014) website that discuss fast-track surgery protocols and recommendations for perioperative, intraoperative and postoperative, whose information the author used in this study.

The first inclusion criteria for the selection was colorectal surgery general with inclusion of both laparoscopic and open surgery and the second inclusion was that articles from all around the world in English text were being searched. Whereas only journal articles from January 2000 to October 2014 were put into consideration as exclusion criteria excluding the ones beyond 2000 and over October 2014.

Below (Figure 6) is the breakdown of how the author found the articles that the author used in this study.

Initial electronic search with word fast track, full pdf text, abstract availability, and from January 2000 to October 2014

Articles excluded after applying inclusion criteria (COLORECTAL and SURGERY)

Articles obtained after authors detailed evaluation  
P=11

Random controlled trials=7  
Systematic reviews=3

Figure 6. Retrieved articles selection from Academic Search Elite (EBSCO)

Thereafter the author listed and presented the 10 articles (Table 2) in a summary form with names of the articles, the authors in the articles, year of publish and journal where the articles were published from.

*Table 2. Summary of 10 articles*

<b>Author &amp; Year</b>	<b>Title of Article</b>	<b>Journal</b>
1) Lazaraki et al., (2009).	Single use of fentanyl in colonoscopy is safe and effective and significantly shortens recovery time.	Surgical Endoscopy
2) Muller et al., (2008).	A fast track program reduces complications and length of hospital stay after open colonic surgery.	Gastroenterology
3) Aasa et al., (2013).	The importance of preoperative information for patient participation in colorectal surgery care.	Journal of Clinical Nursing
4) Burch. J., (2012).	Enhanced recovery for patients following colorectal surgery.	Nursing Standard
5) Wichmann et al., (2007).	Fast-track rehabilitation in elective colorectal surgery patients: a prospective clinical and immunological single-center study.	ANZ Journal Of Surgery
6) Gouvas et al., (2009).	Fast-track vs standard care in colorectal surgery: a meta-analysis update.	International Journal Of Colorectal Disease
7) Yang et al., (2012).	Fast-track surgery improves postoperative clinical recovery and immunity	World Journal Of Surgery

	after elective surgery for colorectal carcinoma: randomized controlled clinical trial.	
8) Feroci at al., (2013).	Fast-track colorectal surgery: protocol adherence influences postoperative outcomes.	International Journal Of Colorectal Disease
9) Zhou et al., (2012).	The enhanced recovery after surgery (ERAS) pathway for patients undergoing colorectal surgery: an update of meta-analysis of randomized controlled trials.	International Journal Of Colorectal Disease
10) Noblett et al., (2005).	Preoperative oral carbohydrate loading in colorectal surgery: a randomized controlled trial.	International Journal Of Colorectal Disease

Third step is to develop an argument by forming logical claims and organize them as evidence of what the topic is about and research questions (table 3); Fourth step is surveying the literature by means of assembling, synthesizing and analyzing data to form logical arguments, evidence, and set of conclusions or claims which will later form the basis for addressing the research questions (table 4); Fifth step is have a critical analysis between the previous and current understanding of the topic in order to answer the research questions; Sixth but not least step is to write, audit and edit the findings, results, methods as a document, this has been discussed in the results and findings of this study research.



### 4.3 Data analysis

Nurse researchers regularly use conceptual models to design and conduct their investigations (Mock et al. 2007). Similarly, the author used the same approach in this paper with Inductive reasoning analysis, a procedure of starting with the general picture, in this study case finding out what is fast-track and colorectal surgery, fast-track's relation to colorectal surgery, the difference between the normal surgery and the one with fast-track strategy, its importance etc. and then having to relate this acquired information to a theory in this case the author chose the Virginia Henderson's Nursing Theory Need's concepts to best describe, relate and use it as skeleton guide to come up with answers to research questions in question and thus moving to a direction for research and practice (Lier & Smith 1999). Deductive reasoning uses two or more related concepts, that when combined, enable suggestion of relationships between the concepts (Feldman 1998).

A conceptual inductive reasoning model or theoretical framework also provides a coherent, unified and orderly way of envisioning related events or processes relevant to a discipline (Fawcett 2005): this is shown in (table 3) where the author tried to compare and between the Virginia nurse need theory concepts as a framework to Fast-track to see if there is any relation between the two in which there was a good consistency. In research, a framework illustrates the overall conceptual design of the study. The terms 'conceptual model' and 'theoretical framework' are often used interchangeably, but a theoretical framework generally incorporates at least part of a specific theory as the basis for a study (Mock et al. 2007). In addition, a theoretical framework often includes propositional statements describing the relationships among variables and has received more testing than the more tentative conceptual inductive reasoning model (Polit & Beck 2004).

The most common use of conceptual inductive reasoning models is to provide an organizing structure for the research design and methods. A second purpose is to guide the development and testing of interventions and hypotheses based on the tenets of the theory. A third function is to explain the study results and place the findings within the context of science in a specific field of investigation. The interpretation of findings flows from the conceptualization represented by the framework (Radwin & Fawcett 2002; Polit & Beck 2004).

### **4.3.1 Content analysis**

Content analysis research method is a systematic and objective means of describing and quantifying phenomena (Sandelowski 1995). It is a method of analyzing data and allows the researcher to test theoretical issues in order to enhance data understanding (Elo & Kyngäs 2008). It is thought that when it is classified into same phrases, categories, words, etc. then it share same meaning (Cavanagh 1997). After the author achieved to relate between fast-track protocols, and Virginia nurse theory's concepts, various research questions arose with two of them being: the benefits of fast-track in colorectal surgery and patient's views on fast-track. The answers were found through the journals and article archived in EBSCO search engine. The two questions' answers were sub-categorized in the appropriate question so as to bring the same meaning and relation.

It is also a research method for making replicable and valid inferences from data to their context, with the purpose of providing knowledge, new insights, a representation of facts and a practical guide to action (Krippendorff 1980). Its aim is to attain a condensed and broad description of the phenomenon whereby concepts and/or categories results (table 4) (Elo & Kyngäs 2008).

#### **Process of analysis**

The author opted to research for colorectal surgery with the application of fast track protocols. Therefore chose to do a literature review based on qualitative data of previous study researches performed between years 2000 to 2014 as stipulated in data collection. The author wanted to know the relationship the two can have based on the literature reviewed presented in data collection, but to do this author also had to find a theory that can relate to this study and form a base of the research questions. Therefore author chose the Nurse Need theory for guidance which then yielded the research questions on this paper.

#### **Preparation, organizing and reporting phases**

The inductive content analysis is represented by three main phases which are preparation, organizing and reporting which basically involves selection of unit analysis, making sense of data, data coding, data grouping, and data categorization etc. (Elo & Kyngäs 2008). Initially the author wanted to test and check if there is a correlation between the theory

author chose and fast track program protocols. In the following tables the results of the inductive content analysis are shown. (Table 3) shows the comparison of the Fast track protocols to the Virginia Henderson's Nurse need theory.

*Table 3. Virginia Henderson's Nurse Need Concepts and variables - Similarities to Fast Track*

<b>Concept</b>	<b>Conceptual Definition</b>	<b>Variable</b>	<b>Fast track Protocol</b>
Health	Recovery, independence	Health	Health goal achievement, benefits, recovery
Individual	Physiological, psychological, sociological and spiritual needs.	Individual	All Preoperative, during surgery and postoperative stages.
Environment	Good client & nurse relationship, cleanliness	Environment	Asepsis before, during and after surgery, counselling, education, information provision.
Nursing	Substitutive, supplementary and complimentary roles of the nurses	Nursing	Cleanliness, asepsis, therapeutic plan follow up, nursing care plan, nursing process and intervention, support, encouragement, follow up,

Thereafter various research questions arise from the relationship between fast track protocols and with regard to Nurse Need theory. The author thereafter respectively reviewed the benefits derived from using and following of fast track program using the questions in (Table 4). These questions were then categorized as health benefits and patients' opinions of the fast track program and where the articles were obtained from.

*Table 4. Research questions and their categories*

<b>Research question</b>	<b>Category</b>	<b>Article</b>
Q1) What are the benefits of fast track colorectal surgery?	C1 Mortality and morbidity	Articles 2,4,6,7 and 9
	C2 Length of hospital stay	Articles 1,2,4,5,6,7,8,9 and 10
	C3 Pain	Articles 1,2 and 5
	C4 Mobilization	Article 8
	C5 Readmission to hospital	Articles 4 and 6
	C6 Gut function	Article 10
Q2) What are patients' views on fast track program?	C1 Patients' satisfaction	Article 3

#### **4.4 Ethics**

Ethics is a norm of conduct, method, procedure, or a perspective that is used to decide how to act and analyze issues and complex problems. Ethical norms in a research promote aims of research such as knowledge, truth, and error avoidance; promote values that are essential to collaborative work such as accountability, trust, fairness etc.; accountability to the public; build public support for research: and promote moral and social values such as human rights, health, law and safety compliance etc. (Resnik 2011).

The author of this study has maintained unbiased research and honesty approach throughout this study. The data collection, results, methods undertaken and procedures truthful originate from articles chosen for this study, guidelines, more book reading and internet researching. All materials, resources, evidences and quotations taken from different books, articles and other references' sources have been properly accredited.

## **5 FINDINGS**

This chapter informs about two findings first being the summary findings in the articles and second is the findings from which the author reviewed that were used to answer the research questions of this study. These findings were derived from 10 articles using deductive content analysis. The articles were categorized according to the questions they provided answers to. There was two questions and 7 categories altogether. Below is the summary of these findings from the articles.

### **5.1 Findings in the reviewed articles**

These are the summary findings reviewed in the articles. The author summarized them so as to get a clear brief picture of what was researched, discussed, the purpose of the articles and its results.

#### **5.1.1 Mortality and morbidity**

Some studies showed that patients who underwent through fast-track program had lower morbidity and mortality rates compared to the ones in the normal conventional program groups. (Muller et al. 2008) in article 2 reported a decrease in number of complication in fast-track. Although the number of complications between fast track group and standard group was in the range of 16 of 76 vs 37 of 75 and hospital days' median of 5 vs 9 days which means that the fast track really proved good outcomes.

#### **5.1.2 Length of hospital stay**

Imposing of fast track protocols and conditions before, during and after the colorectal surgeries in patients was found to reduce hospital length of stay. Eight studies reviewed (articles 1,2,4,5,6,7,8,9, and 10) showed that length of hospital stay was reduced depending on other factors they were researching on such as early oral feeding, effective pain control, low morbidity due to higher immunity in fast-track group, enforced mobilization and early removal of catheter.

### **5.1.3 Pain**

(Lazaraki et al. 2011) in article 1, on his study to evaluate efficacy and safety of fentanyl compared to midazolam on a fast-track program basis, reported results of a mean score of 0.4 in fentanyl group compared to that of midazolam group that was 1.0. Pain score and anus to cecum time were also lower in Fentanyl group compared to midazolam group by 2.59 vs 4.43 with  $p=0.002$  and 8.7 vs 12.9 min with  $p= 0.012$ . No adverse effects on the fentanyl group but there was a decrease in oxygen saturation in the midazolam group by 35%. And also mean recovery time between fentanyl and midazolam was 5.6 vs 16 min.

(Muller et al. 2008) did a randomized trial on fast-track program care vs standard care implementation, and came out with a result that use of epidural analgesia is effective in reducing pain. (Wichmann et al. 2009) in article 5 reported that Nonsteroidal Anti-inflammatory Drugs, wound pumps and patient-controlled analgesia (epidural) should be used as part of fast-track regimen in order to reduce pain.

### **5.1.4 Mobilisation**

(Feroqi et al. 2013) in article 8 reported that early mobilization and ordering patients not to spend much time in bed is beneficial and brings out good outcomes such as less hospital length stay. With the fast-track protocols imposing, the article and evidence showed that patients spent less time in bed after surgery and this led to faster mobilization and a quick return of gut functioning.

### **5.1.5 Readmission to hospital**

Burch and Gouvas et al. reported about readmission rates being not so different between fast-track group and standard/conventional group. This attribute the positive fact that fast-track is accountable and relevant like the standard/traditional one.

### **5.1.6 Gut function**

Faster return of gastrointestinal function resumed after surgery where fast-track protocols were implemented such as early solid enteral feeding, and early mobilization.

(Noblett et al. 2006) in article 10 reported that hospital stay days in carbohydrate group vs water group vs fasted group was 7.5 vs 13 vs 10. And also he goes on to report that the bowel movement in carbohydrate group vs water group vs fasted group occurred in day 3 vs 5 vs 4. And that grip strength was lower in the fasted group.

### **5.1.7 Patients' satisfaction**

(Aasa et al. 2013) in article 3 talked about patients' feelings and views about the fast-track program. The patients were interviewed and the result was that they felt confirmed and involved in the program. Reliance on caregivers was seen as vital because the patients trusted and felt safe in having prior knowledge by being informed and hence participating in their own care.

## **6 DISCUSSION**

According to (king et al. 2006) and (Wilmore & Kehlet 2001), fast-track surgery involves preoperative education, nutrition, optimal pain control, epidural or regional anesthesia, ambulation, postoperative oral nutrition, and minimally invasive techniques. From the articles reviewed for this study and its history, Fast-track protocols have overly successfully been used to provide care for colorectal surgery patients to bring out results such as quality of recovery, short hospital length of stay and reduction of morbidity rates.

### **6.1 Findings of the research questions**

The purpose of this systematic review study was to find out the benefits of the fast-track or enhanced recovery program and also find out what the patients who have undergone and experienced the program think of it. Below are the answers to the research questions of this study.

### **6.1.1 What are the benefits of Fast track colorectal surgery?**

Journal article 2, 6, and 8 reviewed showed that fast-track program implementation is safe, because it showed a reduction of morbidity and mortality. However (Muller et al. 2008) in their method description did not put the age and gender of the participants into consideration because according to (Kirchhoff et. al 2010) patients older than 80 years and male gender may have higher complication rate post-surgery and so this can cause high mortality and morbidity and thus decrease the real outcome of fast-track. (Burch 2012) in article 4; (Gouvas et al. 2009) in article 6; and (Zhou et al. 2012) in article 9 reported that fast-track program minimize postoperative complications such as infections, low complications and low morbidity, however Gouvas reported no difference or increase in mortality between the standard and fast-track groups. Overall the studies proved that what they were researching worked but Zhou et al. (2012) and Burch (2012) did not have as many participants for a more sound research compared to Gouvas et al. (2009).

(Yang et al. 2012) in article 7 reports finding blood levels of globulin, immunoglobulin G, and complement 4 higher on postoperative day 3 in the fast-track group than conventional group, hence concluding higher immunity levels. Higher immunity levels means that there will not be ground for the patient to acquire infection post-surgery or if there is then the rate will be lower hence this overall will have positive effect in morbidity for the patient. The nurses who are with the patients the most are the ones to oversee that physician's prescriptions, instructions and proper hygiene for the patient are adhered to and maintained at all times. Virginia Henderson emphasizes on caring, doing and assisting the patient so as to recover and gain independence.

With regard to fast-track, mobilization and gut functioning resulted. The journal article 5 and 10 reviewed wrote about encouraging and helping patients move around, not staying in bed for too long and try to eat while in an upright or sitting position which then led to better gut functioning. This also can include the early removal of catheterization postoperatively and avoidance of drains according to the fast-track protocols. This goes in line with Henderson's nursing need theory which emphasizes importance of increasing the patients' independence so that hospitalization would not be delayed by providing nursing assistance supplementary and/or complimentarily. Noblet et al. (2006) discussed about



giving early oral feeding as this was seen to help patient gain strength and hence speed up recovery. Nutrients in food help any weak person let alone a post-surgical patient regain strength, is safe and can be tolerable. Carbohydrate foods are some of the food groups that achieve that. Hence this can positively affect post-operative outcomes.

Pain was optimally controlled through the fast-track protocol implementation in journal article 1, 2, and 3. Pain is one of the stressful effects post-surgery. It can make everything so hard on the patient including recovery. With pain on the line, other fast track protocol strategies such as early mobilization or feeding cannot be achieved. Hence pain is one of the first things to be taken care of post-surgery. Post-operative patients undergo pain resulting from surgical procedures, hence pain medications are deemed vital in order to get rid of pain, reduce discomfort and give relief physically. This can be done by first assessing the patients comfort needs, developing and implementing a care plan, and evaluating patients comfort after pain reduction measures have taken place. This can be done for example through observation or by asking the patient their level of pain from a scale of 0-10 respectively.

According to (Berner 1982) one of the nursing roles is to alleviate pain. Nurses must find out the total effect of approaches in relieving pain (Mahfudh 2011). Nurses role in controlling patients' pain include believing the patient, using clinical judgement, creatively assessing pain (for example asking the patient the level of pain from a scale of 1-10 with 1 being the least and ten the maximum), identifying the cause of the problem, planning the care, administering medication, evaluating effectiveness and follow up.

The readmission rates were the same for fast-track implemented groups as in the standard/conventional care groups according to journal article 6. However, length of hospital stay was evidently reduced respectively following fast-track implementation in journal article 2, 4, 5, 6, 7, 8, 9, 10 respectively. Early oral feeding means that the patient would regain gut function which will allow for alertness, strength, movement and proper nutrients in the body. When this is being underway, together with pain control it would then be easier on the patient to get out of bed and around as part of fast track protocol. Moving around would prevent bedsores that can create infection. Hence when there is good im-

munity, no infection and patient has gained some independence, then it is safe to discharge that patient. With fast track, this can be achieved in a shorter period of time hence make hospital stay less. In the end it would allow the possibility for the hospital to admit other patients and also would be cost effective for patient to not have the need to pay more hospital bills if they were to stay longer.

Effective nursing care promotes health. According to Virginia Henderson's nurse need theory, nursing is a procedure for assisting, caring, health promotion, illness prevention and health restoration so as to gain own independence. The Need Theory in conjunction with fast track provide a guideline and help to facilitate the nurse's ability and roles in helping fasten the recovery by catering to patient's basic needs, assistance and providing information and education regarding the treatment while in the care process (Vera 2014).

### **6.1.2 What are the patients' views on Fast track program?**

Patients had positive views about the program. They felt confirmed and involved in the program. In the preoperative fast-track protocol which the author has outlined earlier in this study, it states provision of information and education to patients and patients' roles pre, intra and post-surgery.

It is important that patients have the knowledge of what they are involved in. This brings awareness and helps in treatment and recovery because all the precaution measures, instructions and info given to patients would be known to them and taken care accordingly, hence it means less risks. Nurses play in this dynamic as informants, educators and counsellors. Therefore a nurse should be well educated on the problem at hand, in this research study for example Fast track: its strategies and protocols, aims, outcomes, methods, if there is side effects, benefits over the conventional/traditional way etc. This will make the patient know what to expect and also allow them to make choices as individuals.

Henderson believes that society expects the nurses to act upon and provide services for individuals who cannot function independently. Henceforth there must be a link and communication between the individual and the nurse in order to create an environment for better health outcomes which will therefore lead to fast recovery (Vera 2014). This

is true as the nurse and patient have to deliver and communicate information, set goals, and then act in accordance to the goal plans in order to achieve the basic assumption of the nursing process.

Hence the nurse's role and goal is therefore to help maintain patient's health by promoting and restoring health in form of educating, counselling and giving information about the fast track colorectal surgery, hospital stay and follow up after hospitalization and caring for the post-surgery patient with the help of a nursing process that includes diagnosis, planning, implementation, and evaluation of the nursing care process. This will help the patient achieve healthier outcomes and be independent as assumed by Henderson.

## **6.2 Validity and reliability**

Reliability is referred to as the "extent to which results are consistent over time and an accurate representation of the total population under study and if the results of a study can be reproduced under a similar methodology, then the research instrument is considered to be reliable" (Joppe 2000).

"Validity determines whether the research truly measures that which it was intended to measure or how truthful the research results are. In other words, does the research instrument allow you to hit "the bull's eye" of your research object? Researchers generally determine validity by asking a series of questions and will often look for the answers in the research of others" (Joppe 2000).

Author of this study paper reviewed scientific journals and literature that correspond with the research questions and then grouped the revised content into categories as explained in the methodology. The reviewed articles used in this study were retrieved from EBSCO, a reliable database containing research work done by professionals in the field. The articles' results were then arranged together with the appropriate research question. The author systematically named the units in the categories that contributed to building a foundation of results that provided answers for the research questions of this study.

### **6.3 Strength and limitations**

Fast-track/enhanced recovery program is a new approach in the health field started in the 1990s with not so much researches done yet, hence it was not easy to find many scientific journals and articles for this study especially concerning the patients' feelings and views and nurse roles-intervention in fast track as single based studies. The selection was very limited.

Some studies are not referring directly to enhanced recovery or fast-track program, hence the search strategy could not or may not have found all necessary study articles.

Most of the researched articles had a low number of patients, which could mean not very significant results variety could have been detected compared to if there was a higher numbers of patients in each study research.

## **7 CONCLUSION AND SUGGESTIONS**

The systematic reviews prove that enhanced recovery program in colorectal surgery is evidence-based, efficient and improves quality of life in both preoperative, intraoperative and postoperative. This proves that fast track is safe and beneficial. Morbidity rates were seen to decrease where fast track protocols were implemented whilst mortality rates were the same between conventional/standard care group and fast-track group. Early patient recovery was achieved due to early encouraged mobilization, pain monitoring and enteral solid food feeding. Length of stay observed in the studies with implementation of fast track protocols was shorter compared with traditional perioperative care due to low morbidity, low infection rate, early mobilization. This on the other hand was beneficial for the patients since it brought about cost reductions and it also meant an increase in new admissions for the hospital.

Since fast-track is still a new approach, more research, knowledge and skills are required. One criteria would be to frequently educate staff who are involved in the program so as to get used to the program and bring about the best quality of care. Also there were not enough journal articles researching fast track program on a nurse's perspective.

Patients also on the other hand should be well informed about the program prior to being admitted. This will then bring patients' awareness of what they will be encountering, experiencing, and what they are required to do on their part, which in return, will result in a good relationship and cooperation between them and the healthcare staff and hence provide meaningful treatment and better quality of life.

Organ dysfunction, fatigue, pain, immobilization, nausea, and vomiting depending on individual factors such as: severity of disease, age, complications, social circumstances are some of the effects that determine post recovery. Henceforth more emphasis should be focused on need for care for postoperative patients by reviewing and reconstructing protocol strategies and ways of implementing them.

More research is required on the patients' views and opinions of fast track as there was no many articles discussing on the subject. The author recommends thorough research in order to have more concrete evidence based patients' views on the fast track program for better understanding and efficiency of the program.

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## APPENDICES

*Table 1. Reviewed articles*

Articles	Journal	Aim	Method	Conclusion
1) Lazaraki et al.	Single use of fentanyl in colonoscopy is safe and effective and significantly shortens recovery time (2012).	To evaluate efficacy and safety of intravenous administration of fentanyl in titrated doses compare with intravenous administration of well-known midazolam in titrated doses.	Systematic review, qualitative information. 129 patients involved.	Fentanyl administration seemed sufficient and satisfactory in pain reduction
2) Muller et al.	A fast track program reduces complications and length of hospital stay after open colonic surgery (2008).	To investigate the impact of fast-track protocol on postoperative morbidity in patients after open colonic surgery.	Randomized trial, 156 patients on fast-track or standard care regime.	Postoperative complications and hospital length of stay reduced. Fluid and effective epidural analgesia had good effects in the fast-track group.
3) Aasa et al.	The importance of preoperative information for	To identify and describe patients' experi-	Interview. 12 patients involved.	Results show that patients feel confirmed

	patient participation in colorectal surgery care (2013).	ences of a pre-operative information session with a nurse as part of the enhanced recovery after surgery concept, its impact on patient participation in their own care.		in ERAS conversation.
4) Burch. J.	Enhanced recovery for patients following colorectal surgery (2012).	To research for enhanced recovery outcomes.	Random controlled trial.	Postoperative complication such as infections minimized. Fast recovery and hospital length stay shortened.
5) Wichmann et al.	Fast-track rehabilitation in elective colorectal surgery patients: a prospective clinical and immunological single-center study (2007).	To test clinical parameters of pain score, complication rate, food intake, postoperative length of stay and perioperative immunity.	40 patients involved. Randomized clinical trial of fast-track vs conventional rehabilitation control trial.	Short length of hospital stay, less pain, faster return of gastrointestinal function.
6) Gouvas et al.	Fast-track vs standard care	Examination of latest evidence	Systematic review.	Hospital stay reduced, low

	in colorectal surgery: a meta-analysis update (2009).	standard care vs fast-track protocols in elective colorectal surgery in rectal and/or segmental colonic resection.		morbidity and similar readmission rates.
7) Yang et al.	Fasts-track surgery improves postoperative clinical recovery and immunity after elective surgery for colorectal carcinoma: randomized controlled clinical trial (2012).	Investigation of immune and clinical impact of fast-track surgery in colorectal cancer patients undergoing elective open surgery.	Quantitate analysis, random controlled trial.	Fast-track enhance recovery and improves immunity.
8) Feroci at el.	Fast-track colorectal surgery: protocol adherence influences postoperative outcomes (2013).	Identification of importance of each fast-track surgery procedure and protocol adherence level on clinical outcomes after colorectal surgery.	Quantitate analysis, random controlled trial.	Fast-track adherence is proportional to postoperative outcomes.

9) Zhou et al.	The enhanced recovery after surgery (ERAS) pathway for patients undergoing colorectal surgery: an update of meta-analysis of randomized controlled trials (2012).	Efficacy and safety exploration on enhanced recovery programs after colorectal resection.	Systematic review.	Enhanced recovery after surgery reduces complication rates, length of stay with regard to patients' safety.
10) Noblett et al.	Preoperative oral carbohydrate loading in colorectal surgery: a randomized controlled trial (2005).	Assessment of effects of preoperative carbohydrate administration on grip strength, gastrointestinal function and hospital stay after elective colorectal surgery.	Quantitative analysis, random control trial.	Food tolerance and shorter hospital stays.