



The Bowel Surgery:

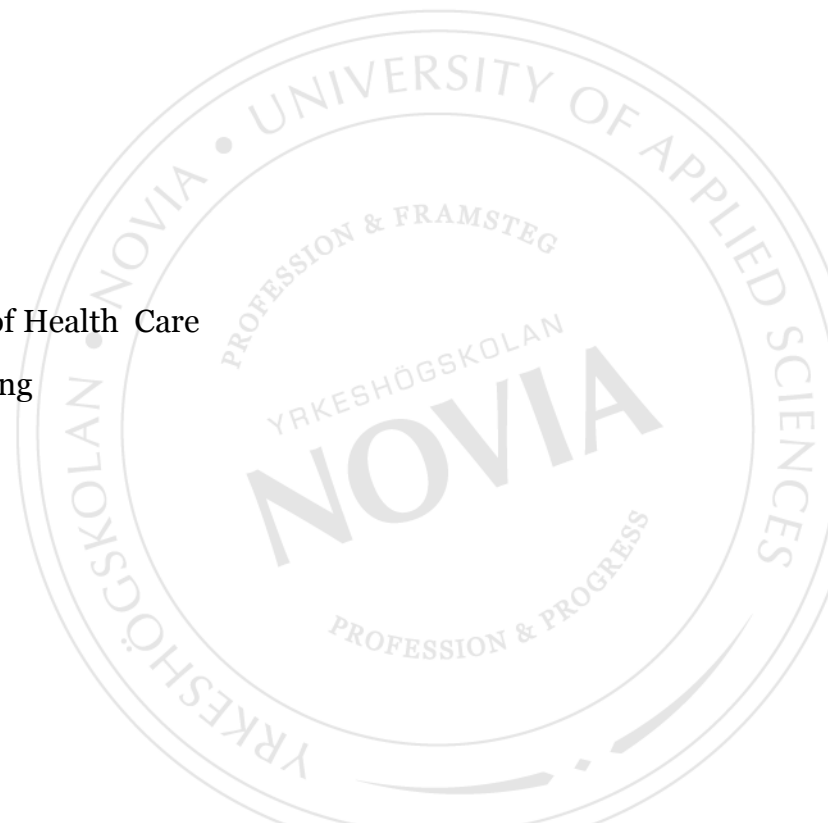
**Understanding Common Indications for Bowel Surgery,
and Necessary Nutrition Support and Patient Guide.**

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BACHELOR'S THESIS

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Abstract

Although there is an increase in bowel diseases cases of which lead to bowel surgery, less attention has been put on patient education on nutrition after surgery. The aim of this thesis is to explore and gain a deeper understanding and knowledge about bowel surgery, and necessary nutritional support and guide the nurses ought to give to a patient after bowel surgery.

In this systematic literature review and use of content analysis, the study endeavours to answer the research questions; what are the indications for bowel surgery, how does bowel surgery change the nutritional situation of the patient and what are the necessary steps a nurse should take to support, guide and educate the bowel surgery patient.

As bowel surgery requires removal of all or part of the bowel, this impedes the patients' normal process of nutrition absorption of which a role of the bowel. Overall, the findings demonstrate that it is crucial to provided nutritional support and guidance to bowel surgery patients to facilitate their quick recovery and independence. However, it also points out that a nurse should not only focus on nursing care, but should also possess the necessary knowledge on nutrition in order to provide optimum patient guidance and education.

Language: English Keywords: bowel, bowel surgery, nutrition, patient guidance,

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Table of Contents

1. Introduction.....	1
2. Aim and Research Questions.....	3
3. Theoretical Framework.....	4
4. Theoretical Background.....	6
4.1 The Bowel.....	7
4.2 The Large Bowel.....	8
4.2.1 The Ascending Colon.....	9
4.2.2 Transverse Colon.....	9
4.2.3 The Descending Colon.....	10
4.2.4 The Sigmoid Colon.....	10
4.2.5 Blood Supply.....	10
4.3 Functions of the large bowel.....	11
4.4 The types of bowel surgeries.....	12
4.4.1 Colorectal Surgery.....	12
5. Methodology.....	13
5.1 Systematic Review.....	14
5.2 Content Analysis.....	15
5.3 Conduction of the Study.....	16
5.3.1 Data Collection.....	17
5.3.2 Data Analysis.....	17
6. Themes and Result Presentation.....	18
6.1 Indications for Bowel Surgery.....	19
6.1.1 Colorectal Cancer.....	19
6.1.2 Inflammatory Bowel Disease (IBD).....	20
6.2 Nutritional Problem after Surgery.....	21
6.2.1 Micronutrients Deficiencies.....	22

6.2.2	Macronutrient Deficiencies	23
6.3	Nutrition after Surgery.....	24
6.3.1	Fluid Therapy Nutrition	25
6.3.2	Enteral Nutrition.....	25
6.3.3	Patient Education.....	26
7.	Interpretation of Results	27
8.	Critical Review	30
9.	Discussion and Conclusion	31
10.	Work Cited.....	34
Figure I.	The bowel (Intestines) (WebMD online)	7
Figure II.	The Large Bowel (The Colon). (WebMD online)	8

1. Introduction

The prevalence of bowel diseases, of which lead to bowel surgery are on rise in several areas of the world, therefore there is a need for nurses to provide nutritional guidance to patients in a post-surgery state. It is not only the care for bowel disease patients that is complex and challenging in nature, but also the post-surgery complications and related conditions of which lead to the patients' physical health. According to Luftus (2004), as many as 1.4 million persons in the United States and 2.2 million persons in Europe suffer from bowel diseases. He further argues that, the modification of Ulcerative colitis and Crohn's disease may be linked to environmental factor.

After surgery, it is common for patients to experience episodes of unreliable bowel habits, such as diarrhoea, and constipation. And more, protein-energy malnutrition is a prominent feature of the bowel disease, to mention the Crohn's disease (CD). Its development is due to the systemic inflammatory response. Anorexia, inadequate food intake, reduced absorption, increased intestinal loss and altered protein synthesis, all contribute to a significantly reduced nutritional status (Van Gossum, Cabre, He'buterne, Jeppesen, Krznaric, Messing, Powell-Tuck, Staun, & Nightingale 2009). However, some of these conditions may be due to the consumed foods that may lack the proper nutrients. Therefore, it is advisable to have a dietary plan to follow after a bowel surgery.

It is also argued that emotional and social support are vital elements that may enhance or complicate the care for a bowel surgery patient. And, any of the vital elements may affect the nutritional health of a patient, an essential element

of care that supports the healing, recovery, and improved quality of life (Childs 2008: 283). Therefore, it is of vital importance that nurse acquire the needed knowledge in anatomy, pathophysiology, nutritional and physiology in order to care, support, guide and educate patients in the process to recovery and gaining their full independence.

Bowel surgery in general is imprecise term, due to the range of concepts it encompasses. Therefore, the scope of this study will be limited to large bowel surgery, also known *as large bowel resection*. The large bowel, also known as the large intestine is divided into sections. These include, ascending colon, transverse colon, descending colon, sigmoid colon and rectum. However, some books do not include rectum to the large bowel.

The term bowel surgery¹ refers to a procedure in which a part of the large or small intestine removed. This could be done due to, or inline to managing several disorders of the bowel. In the study, the terms, bowel surgery and bowel resection maybe used interchangeably.

¹ Bowel surgery is also known as bowel resection, a resection is another term used for any operation that involves removing of tissue or part of an organ.

2. Aim and Research Questions

The aim of this study is to identify, describe and justify the need for the nutritional guidance after bowel surgery. Due to several ailments related to the digestive system, and the bowel in particular, bowel surgery could be recommended and undertaken to correct the defects and death related conditions of a patient. In this study, aim will be put to understanding the factors and reasons to why bowel surgery is taken, its effect to the body inline to nutritional changes.

Further, the study will outline the necessary steps and support that the nurses ought to give to the bowel surgery patients. In this, the study will assume and emphasise the nurses' work of educating the bowel patients during their stay at the hospital and the necessary guidance after discharge from the hospital.

In the end, the study will be able to the following questions;

1. What are the indications for bowel surgery?
2. How does bowel surgery change nutritional situation of the patient?
3. What are the necessary steps a nurse should take to support, guide and educate the patient during hospital stay and after discharge from hospital?

3. Theoretical Framework

Jean Watson's model of self-care and caring for others is chosen as a theoretical framework.

Initially, the theory of human caring was Watson's initial works – *Nursing: the philosophy and science of caring*, 1979. The publications were done before formal attention was put to nursing theories as a disciplinary foundation for nursing science, education and practice.

The theoretical concepts were derived and emerged from her personal (professional) experiences, of which was clinically inducted, empirically grounded and combined with philosophical, intellectual and experiential background. Thus, the early work that emerged from own beliefs, values, perceptions and experiences about pretentious and inexpressible questions. Nursing is viewed as an art and a science, this makes it more similar to a human science tradition and thus the science of caring. She further observes that, nursing has immersed its scientific and artistic heritage in its scientific quest, and preoccupation with evidence-based practice (Watson 2008, 2007).

The theory of human caring has core concepts, and these include; a rational caring for self and others, the caring moment, multiple ways of knowing, and reflective approach. These need to be based on a moral foundation and values.

In addition, the transpersonal caring relationships concept involves going beyond ego, to higher spiritual caring created by caring moments. Moral commitment to protect and enhance human dignity, respect for the person and

honouring their wishes, needs and ritual need to be adhered to, thus heart centred-healing.

According to Watson (1999), *Theory of Human Caring* explores a holistic approach to nursing. In this theory, Watson seeks to blend nursing as a science and art. Whereas, there is a scientific basis for the nursing practice, it is the body the mind and spirit' of both the caregiver (nurse) and the care receiver (patient) that has the greatest impact on the outcome of care.

This theory contends that the nurse's care for patients extends beyond human contact and focuses instead on the soul of the patient. The value of respect, reverence, and autonomy are central to this theory. Watson, mentioned by Childs states that, the guiding value for the model is the idea that caring is the moral ideal of nursing with a concern for preservation of humanity, dignity, and fullness of self (Childs 2006: 284).

In the caring practice, complex care is delivered with a belief that understanding fosters healing (Watson 2005). In this, Watson is convinced that when a nurse cares for a patient, the nurse enters into the "life space" of that patient and detects his or her condition at spiritual level. The nurse connects with the patients at a deep spiritual level, sometimes only for the moment and that "connectedness" allows both the nurse and patient to heal.

The emphasis of Watson's theory and its ascribed method of caring is focus on the care of the whole patient rather than the pathology and treatment of the patient's disease. Communication between the patient and the nurse is less verbal and more with the touch, gestures, and sounds. The healing may need to

be at an ontological/ spiritual level before physical healing can begin (Alligood & Tomey 2002).

Main concerns about bowel surgery patient is the nutritional health. The patient should be able to maintain his health, in any case where the patient is unable to maintain his or her health, some medication and treatments may be withdrawn. Therefore, it is crucial for a patient to receive advice, support and recommendations and support for nutritional health in order for continuation of treatment and optimisation of quality of life (Childs 2006: 284).

4. Theoretical Background

The theoretical background chapter contains descriptions and definitions of concepts that are used as a basis of this study. Therefore, the theoretical background is the basis of understanding and explaining this study. The theoretical background will explain and describe what the bowel is, with focus to the large bowel it will elaborate the parts of the large bowel/ large intestines, and explain surgery type involved in the large bowel. The term large bowel and large intestines could be used interchangeably. And where necessary, illustrations with the help of figures will be done for clarity.

In an attempt to understand bowel surgery, it is necessary to initially understand the under laying concepts that form the term "Bowel Surgery", thus the "Bowel" and "Surgery".

4.1 The Bowel

The bowel is part of the body's digestive system. The digestive system is made up of the oesophagus, stomach, the small and large intestines (The small and large bowel). On the digestive system, it is the bowel that removes and processes nutrients (vitamins, minerals, carbohydrates, fats, proteins, and water) from foods and helps pass waste material out of the body. In this study, the focus is aimed at understanding the large bowel/ large intestine or the colon (Jorge & Habr-Gama 2007). See figure I.

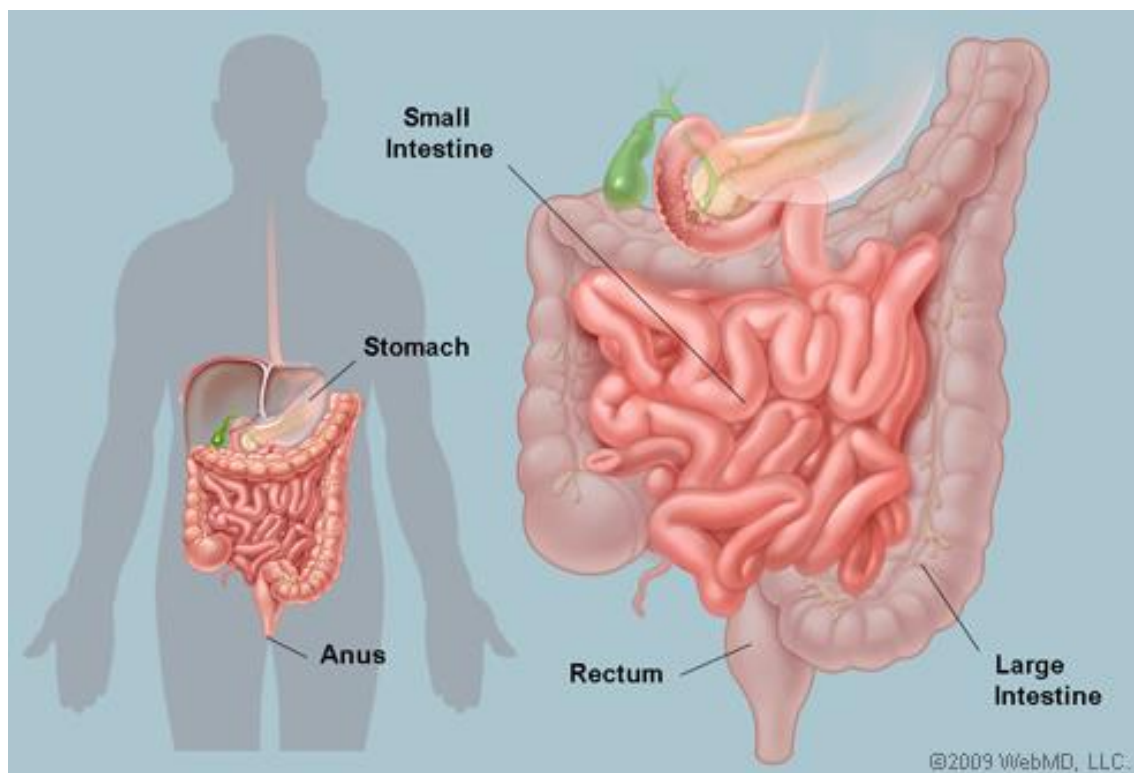


Figure I. The bowel (Intestines) (WebMD online)

4.2 The Large Bowel

On the digestive system, the first six feet of the large intestine are called the large bowel or the colon. And the last six inches of the large bowel are referred to as the rectum, and the anal canal. The anal canal ends at the anus. The anus is an opening at the end of the large bowel, from which the waste is excreted out of the body.

The large bowel represents the end of the digestive system. It connects the small bowel at the cecum, ascends up and across the abdomen and then ascends down to the rectum (New Health Guide 2014). The large bowel or the colon is also divide into five segments; - See figure II

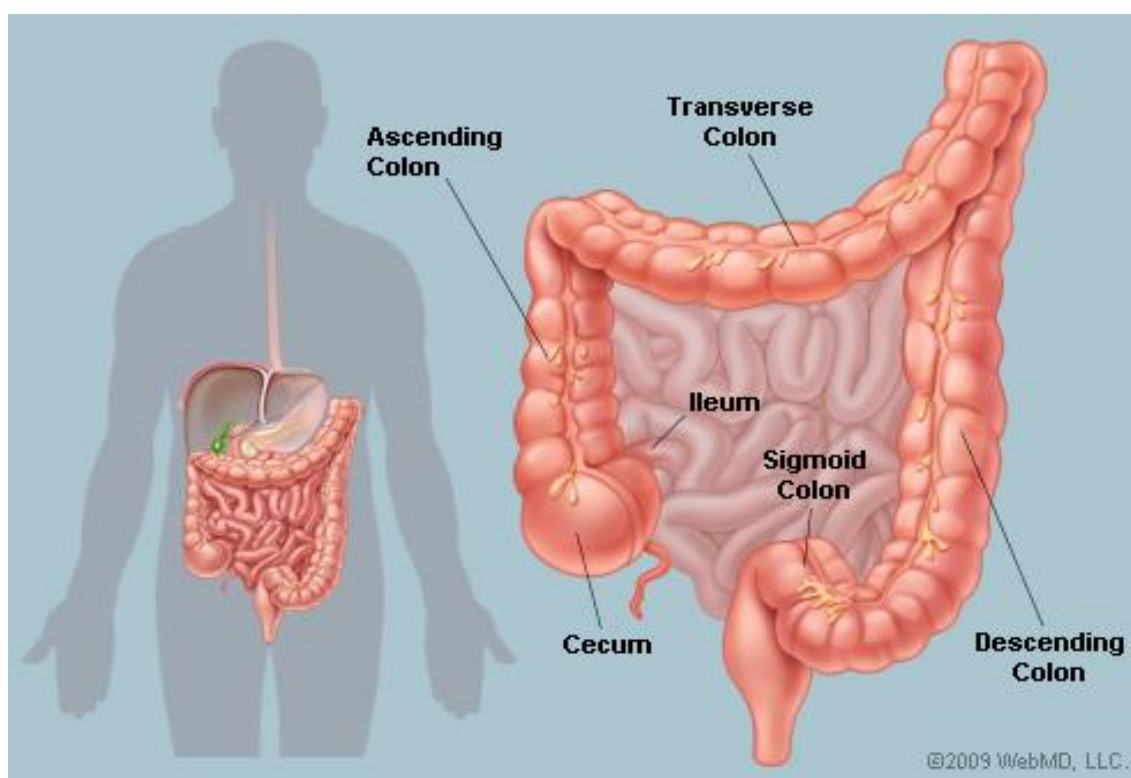


Figure II. The Large Bowel (The Colon). (WebMD online)

4.2.1 The Ascending Colon

The ascending colon is approximately 15 centimetres long. It ascends, from the level of the ileocecal junction to the right hepatic flexure, laterally to the psoas muscle and anteriorly to the iliacus, the quadratus lumborum, and the lower pole of the right kidney. It is covered with peritoneum anteriorly and on both sides. At the visceral surface of the right lobe of the liver and lateral to the gallbladder, the ascending colon turns sharply medially and slightly caudad² and ventrally to form the right hepatic flexure (Jorge & Habr-Gama 2007: 14).

4.2.2 Transverse Colon

Transverse colon is approximately 45 centimetres long, and it is the longest segment of the large bowel. It crosses the abdomen, with an inferior curve immediately caudad to the greater curvature of the stomach. The transverse colon is relatively fixed at each flexure, and, in between, it is suspended by a 10–15 centimetres wide area which provides variable mobility; the nadir of the transverse colon may reach the hypogastrium. It is completely invested with peritoneum, but the greater omentum is fused on its anterosuperior aspect (Jorge & Habr-Gama 2007: 14).

² Towards the end

4.2.3 The Descending Colon

The descending colon courses downward from the splenic flexure to the brim of the true pelvis, a distance of approximately 25 centimetre. Similarly to the ascending colon, it is also covered by peritoneum only on its anterior and lateral aspects. Posteriorly, it rests directly against the left kidney and the quadratus lumborum and transversus abdominis muscles. Though, the descending colon is narrower and more dorsally situated than the ascending colon (Jorge & Habr-Gama 2007: 14).

4.2.4 The Sigmoid Colon

The sigmoid colon is a 35–40 centimetre long, mobile, omega-shaped loop completely invested by peritoneum. The meso-sigmoid is attached to the pelvic walls in the averted V shape, resting in recess known as the inter-sigmoid fossa. The left ureter lies immediately underneath this fossa and is crossed on anterior surfaces by the spermatic, left colic and sigmoid vessel (Jorge & Habr-Gama 2007: 14).

4.2.5 Blood Supply

Blood supply to the entire large bowel is supplied by the inferior and superior mesenteric arteries, and the limit between the territories is the junction between the proximal two thirds and the distal third of the transverse colon. This

represents the embryologic division between the mid-gut and the hindgut (Jorge & Habr-Gama 2007: 14).

4.3 Functions of the large bowel

The overall function of the large bowel is the completion of absorption, the production of some vitamins, the formation of faeces, and the expulsion of faeces from the body. In this, the large bowel is primarily responsible for the removal of water from the contents of the intestines, and prepares waste as a solid that is later expelled from the body through the anus. And it also absorbs vitamins (Tortora & Derrickson 2012: 1006, New Health Guide).

There are several beneficial bacteria that live in the large bowel. These are tasked with the role to breakdown undigested sugars and fibres into fatty acids. The commensal bacteria also create the gas that is composed of methane, hydrogen sulphide, and carbon-dioxide. The beneficial bacteria also produce vitamin K and Biotin that are absorbed back into the body (Tortora & Derrickson 2012: 1007, New Health Guide).

Further, the large bowel reduces acidity and protects the body from infections. The bacteria in the large bowel produce fatty acids that cause an acidic environment in the gut. The large bowel also produces alkaline solutions that help in reducing the acidity and balance the PH in the bowel. The mucous lining of the large bowel acts as a protective layer that prevents the harmful bacteria from being reabsorbed into the body (New Health Guide).

4.4 The types of bowel surgeries

Bowel surgeries include; anorectal and colorectal surgeries. However, this study will focus on the colorectal surgery.

4.4.1 Colorectal Surgery

Colorectal surgery is a high risk surgery, and is usually indicated for the treatment of bowel cancer, diverticular, or inflammatory diseases. However, there are other indications for colorectal surgery of which include; ischemic colitis, iatrogenic perforation or injury, and volvulus. For an effective nutritional management and patient nutritional education after surgery, an understanding of basic sciences specific for colorectal surgery (anatomy of the colon) is required (Patel, Lutz, Panchagnula, & Bansal. 2012).

It is argued that recovery after open colorectal surgery can be accelerated by adopting perioperative evidence-based practices, thus accelerated recovery after surgery. The post-surgery management should involve anaesthesiologists, surgeons, nursing staff, nutritional experts, acute pain team, pharmacists, and physiotherapists. This doesn't only help to facilitate quick recovery and independence, but also reduces postoperative morbidity (Patel et al. 2012). In this study, the focus is put to nutritional experts and nursing staff.

5. Methodology

In this study, qualitative research method is chosen for use. This is due to its flexibility in approach to data collection and analysis. In qualitative research, the study designs evolves during the project. In this, researchers design as they do. Decisions on how best to obtain the data, from whom to obtain data, and how long data collecting sessions should last are made as the study unfolds. Qualitative studies use an emergent design ³ that evolves as the researcher makes ongoing decisions based on what they have already learned (Polit & Beck 2014: 515).

More still, researchers continue examining and interpreting data and make decisions on how to proceed based on what has already been discovered (Polit & Beck 2014: 519). The researchers usually put focus on an aspect of a topic that is poorly understood, and of which little may be known. Though the topic area maybe narrowed and clarified, for self-reflection and discussion, also researchers can proceed with a broad research topic to enable them put emphasis on improving and explaining more clearly when the study is underway.

Qualitative research as a term is often applied to naturalistic investigations—research that involves studying phenomena in places where they happen. And so, qualitative research approaches are based on a perceived perspective that there is no any reality. Instead, reality is viewed perceptions that differ from person to person and change over a time, and meaning can only be truly

³ In qualitative studies, an emergent design is a reflection of the researchers' desire to have the inquiry based on the realities and viewpoints of those under study, of which are have not been known at the beginning

understood if it is associated with a specific situation. Qualitative research is about understanding phenomena and finding means through examining the pieces that make up the whole (Yost 2014: 24).

5.1 Systematic Review

A systematic review involves integration of research evidence about a specific research question with the use of carefully developed sampling and data collecting procedures that are spelled out in advance in a protocol. In systematic review, reviewers use methodical procedures that are, for most part, reproducible and confirmable. Since evidence based practice relies on thorough integration of research evidence, that's to why systematic review is considered a cornerstone to evidence based practice by many. However, systematic reviews that integrate research evidence (Polite & Beck 2012: 653).

The distinguishing element about systematic review is its process of developing, testing and adhering to protocol with explicit rules for gathering data—the research evidence—from studies that address a particular question. Current developments in systematic review have exhibited integrated finding in qualitative and quantitative studies, and from mixed methods. However, the mixed studies are quite new, and several different strategies are being pursued. Few years to come, it is possible that methodological development could lead to enhancement and greater clarity on a best way to undertake such reviews (Polite & Beck 2012: 653—154).

In addition, there has been an emerging mixed method review, the “third research community” of which has increased interest in systematic reviews that’s that integrate findings from a broad methodologic array of studies. These reviews are quite new, and their terminologies and approaches are still developing. However, the term “systematic mixed studies review” had been coined to refers to a systematic review that uses disciplined and auditable procedures to integrate and synthesize findings from qualitative, quantitative and mixed method studies (Polite & Beck 2012: 672).

5.2 Content Analysis

Content analysis is a common term for a number of different strategies used to analyse text (Powers & Knapp 2006). Content analysis is commonly conducted in qualitative studies. It is due to the fact that most qualitative studies claim no particular disciplinary or methodologic roots. And in this, researcher may simply indicate that they have used a qualitative study or a content analysis of qualitative data. Therefore, some qualitative studies do have a formal name, and could be referred to as descriptive qualitative studies (Polit & Beck 2014: 533).

Furthermore, content analysis refers to a systematic coding and categorising approach used for exploring large amounts of textual information discreetly to determine trends and patterns of words used, their frequency, their relationships, and the structure and disclosures of communication (Gbrich 2007). And also, according to Polit and Beck (2012: 723), content analysis is “the process of organising and integrating materials from documents, often

narrative information from qualitative study, according to key concepts and themes". Way back through the history of nursing studies, qualitative content analysis has been used.

Content analysis aims at describing the characteristic of the document's content by examining who says what, to whom, and with what effect (Bloor & Wood 2006). In several cases, qualitative researchers that conduct descriptive qualitative studies could easily say they performed a 'content analysis'. Qualitative content analysis involves analysing the content of narrative data to identify prominent themes and patterns among the themes. It also includes, breaking down data into smaller units, coding and naming the units according to the unit they represent, and grouping coded material based on shared concepts (Polit & Beck 2014: 589).

5.3 Conduction of the Study

This study follows a criteria for data collection processes. Therefore, collecting and analysing the data was through a qualitative content analysis method. A data collected would be limited to a period of ten years back. This inclusion span was made to scale down on searched data, and also to put limit on numbers out date data source. However, some selected data out of the inclusion limit was used due to its significance to the study.

5.3.1 Data Collection

The data collection method of this study has been done through an electronic search of the internet, eBook collection (EBSCOhost) and CINAHL databases, google books, google scholar, clinical guidelines and reports examining bowel surgery and nutritional guidance. Search terms included 'bowel', 'bowel surgery', 'bowel and nutrition', 'bowel conditions' and 'nutritional knowledge'.

Citations found in the searches were arranged, and organised by reading the articles, titles and abstracts that were obtained and regarded relevant to the topic of study. The guidelines, articles, papers and reports used were published between 2004 and 2014. More than 500 articles related to the topic of study were found and identified, and those with less or no specific reference the bowel surgery and nutrition were excluded. Therefore, the search was scaled down and 30 full texts articles were obtained and reviewed. However, research primarily on bowel surgery and nutritional guidance is scarce, and mainly related to bowel cancer, inflammatory bowel disease and its management.

5.3.2 Data Analysis

The term data analysis refers to the process of clustering related type of information about a certain phenomenon into a logically connected pattern, and of which could be followed by identifying themes⁴ and categories which are

⁴ A theme refers to an abstract entity that brings meaning and identity to a current experience (Polit & Beck 2012: 562).

aimed at providing us in general, the overall description of the phenomenon in the end. Identifying the theme facilitates and unifies the root basis of the experience into the meaningful overall phenomenon description (Polit & Beck 2012: 62).

As one part of data analysis, it helps with reviewing themes and achieving the aim of identifying coherent but distinctive themes. It is further stated that, another characteristic of data analysis in thematic analysis is drawing a thematic map. In this, visual representations of themes, codes, and their relationships, involving detailed account and description of each theme, their criteria, examples and counter examples, and other related details (Braun & Clarke 2006).

6. Themes and Result Presentation

A theme refers to a coherent integration of disparate pieces of data that constitute the findings (Sandelowski & Leeman 2012). It captures the important aspects about data in relation to the research question, and represents some level response pattern within the data set. (Braun & Clarke 2006). A theme is mainly of a descriptive level of content and thus can be seen as an expression of the manifest content of the text.

In the analysis phase, articles are selected due to their close significance to the study topic. In the end, four themes were chosen. These three themes are critical and on-point to give the conceptual definitions, and explain the causes

- A. Diseases and Indications for bowel surgery
- B. Nutritional conditions after bowel surgery
- C. Nutritional guidance for post bowel surgery patients

6.1 Indications for Bowel Surgery

Indications for bowel surgery may be due to a number of conditions, and these may also be referred to as bowel disorders. These include; colorectal cancer, bowel obstruction, the inflammatory bowel disease and, diverticulitis. These conditions affect the proper and natural functioning of the bowel, and the overall wellbeing of an individual. This study will put emphasis on colorectal cancer and inflammatory bowel disease, of which are the most common indication for large bowel surgery.

6.1.1 Colorectal Cancer

Colorectal cancer (CRC) is one of the most common indications for bowel surgery. It is observed that, patients affected by colorectal cancer present as surgical emergencies in a percentage ranging from 11% to 43% of cases (Coco, Verbo, Manno, Mattana, Cavino, Pedretti, Petito & Rizzo 2005). And among the colorectal cancer emergency treatment, it is argued that, obstruction and perforation are the major indications for the surgery in both the adult and elderly patients (Kesisoglou, Pliakos, Sapalidis, Degliannidis, & Papavramidis 2010).

Colorectal cancer is also associated with bowel obstruction due to narrowing of the lumen by lesion; perforation of the wall by tumour allowing contamination of the peritoneal cavity by bowel contents; and direct extension of the tumour to involve adjacent organs (LeMone, Burke & Bauldoff 2011: 702).

6.1.2 Inflammatory Bowel Disease (IBD)

Inflammatory bowel disease (IBD) is a group of inflammatory conditions of the small intestines and colon. The small intestines and colon are part of the body's digestive system. The digestive system removes and processes nutrients (mineral, vitamins, fats, carbohydrates, proteins and water) from the foods, and helps pass waste material out of the body through the anus. The complete digestive system includes; the oesophagus, stomach, and the bowel/intestines (large and small bowel).

The inflammatory bowel disease (IBD), that comprise of the Ulcerative Colitis (UC) and the Crohn's disease (CD), is a chronic and life long illness of which has social and physiological impact on an individual, of which is beyond the pathology of the disease. It does not only encompass survival and physical wellbeing, but also the disease interacts repeatedly (Rowlinson 1999).

Crohn's disease and ulcerative colitis, jointly referred to as the inflammatory bowel diseases (IBD), are largely diseases of the twentieth century, and are associated with the rise of modern, westernized industrial society. Though the causes of these diseases remain incompletely understood, the main model is

that the intestinal flora drives an unmitigated intestinal immune response and inflammation in the genetically susceptible host (Sands 2007).

It is due to the severe and long-lasting inflammatory cells, and the common occurrences of extra-intestinal immune-mediated manifestations that's eventually led to the use of therapeutic agents such as adrenocorticotrophic hormone and corticosteroids. These agents have proven to be effective in the treatment of the inflammatory bowel disease. However, the surgical improvements have developed the field considerably. Currently, resection and primary anastomosis are the possible surgeries for Crohn's disease patients (Sands 2007).

6.2 Nutritional Problem after Surgery

In a situation where bowel surgery is indicated, before surgery, it is crucial for the patient to be informed and be aware that micronutrient deficiencies may occur. It is common for bowel surgery patients to develop macronutrient or micronutrient deficiency or both, just like bariatric surgery patients. Though bowel and bariatric surgery differ, they both affect the absorption of nutrients in the body. The most common deficiencies after surgery are iron, calcium and vitamin D due to the reduced absorption of nutrients resulting from surgery, other less common deficiencies including vitamin B12, folic acid, and thiamine may occur (Fujioka, DiBaise & Martindale 2011: 53S).

Fujioka et al (2011: 53S) further stress that, specific nutrition related complication may arise after bowel surgery. These may include anaemia (iron;

folate; Vitamin B12, A, and E; copper; zinc), metabolic bone disease (calcium, vitamin D), protein energy malnutrition, steatorrhea⁵, Wernicke encephalopathy (thiamine), polyneuropathy and myopathy (thiamine, copper vitamin B12 and E), visual disturbance (vitamins A and E, thiamine), skin rash (zinc, essential fatty acids, vitamin A), and a variety of potentially clinically silent micronutrient deficiencies.

6.2.1 Micronutrients Deficiencies

It is argued that deficiencies of micronutrients (vitamins, minerals and trace elements) are common especially in the acute phase of Crohn's disease (CD) or after extensive surgery. Also, in children and adolescents a decrease in growth rate may occur as a consequence of systemic inflammatory response, nutritional disturbances and due to drugs like steroids (Van Gossum et al. 2009). During extensive bowel surgery, large portions of the bowel could be removed. This results into poor absorption of nutrients in the body since nutrient and mineral absorption takes place in the bowel, and specifically the small bowel.

Anaemia is a common finding after bowel surgery and bariatric surgery. The causes of iron deficiency may include reduced absorption and reduced intake of iron-rich foods, and in particular the red meat that is poorly tolerated after surgery. In some instances, it may be due to overt blood loss from gastrointestinal sources, like anastomotic ulcers. It should be noted that iron deficiency could be intense and require additional iron replacements. In situations where the

⁵ Steatorrhea, refers to the presence of excessive fat in the faeces, due to poor absorption of fats or indigestion.

patients have difficulty in absorption of iron, it could be administered intravenously (Fujioka et al. 2011: 53S—54S).

It is further noted that anaemia may occur as result of other micronutrient deficiencies or a combination of deficiencies. Vitamin B12 and folate deficiencies may result in development of macrocytic anaemia. Also deficiencies in copper; zinc and vitamins A and E are potential cause of anaemia in bariatric and bowel surgery patients, and therefore, considered when anaemia is not corrected despite adequate replacement of iron, vitamin B12 and folate (Fujioka et al. 2011: 54S).

In addition, other micronutrient deficiencies occur after bariatric surgery and bowel surgery, though they are less commonly seen. These include copper; zinc; fat-soluble vitamins A, E, and K; and essential fatty acids. Clinically, these deficiencies may present; hematologic abnormalities (copper or vitamin E deficiency), neuromuscular symptoms (copper or vitamin E deficiency), and hair loss (zinc deficiency), skin rash (zinc or essential fatty acid deficiency), bruising and bleeding (vitamin K), and visual disturbances (vitamin A and E deficiency). However, when detected, oral replacement of these deficiencies is usually successful (Fujioka et al. 2011: 54S).

6.2.2 Macronutrient Deficiencies

After bariatric and bowel surgery, protein-energy malnutrition is one of the most serious nutrition complications. It may be due to reduced intake of protein such as red meat, which is poorly tolerated after bariatric surgery, or the

development of other gastrointestinal problems that result in poor oral intake and excessive weight loss. Indicators of protein-energy malnutrition include excessive weight loss, hair loss, muscle wasting, and oedema. Though this condition may be difficult to diagnose; however, reduced visceral protein markers such as serum levels of albumin and pre-albumin may be helpful pointers (Fujioka et al. 2011: 54S).

Fujioka et al. (2011: 54S) further stress that fat malabsorption is also an expected consequence. It is definitely through this that, after surgery, bariatric and bowel surgery patients appears to sustain weight loss. The length of the common channel regulates the degree of fat malabsorption—a channel of at least 100 cm seems to be tolerated best. However, in a situation where there is severe fat malabsorption and inability to control it by dietary and medical manoeuvres, surgical revision may be required.

In this, most nutritional deficiencies emanate from the reduced dietary intake, altered dietary choices due to recommended foods, and prescribed medication.

6.3 Nutrition after Surgery

In the process prior to bowel surgery, patients are usually advised to fast for over six hours, and also some cases given enema to clear the bowel of any residues or faecal matter. Therefore, after surgery patients are always at risk of nutritional deficiencies. Fluid and electrolyte replacement is provide following surgery, along with possible parenteral nutrition. Adequate kilocalorie and nutrient intake are necessary for healing after surgery (LeMone et al. 2011: 706)

6.3.1 Fluid Therapy Nutrition

After bowel surgery, fluid therapy is recommended. However, to initiate the fluid therapy, it should take into consideration maintenance requirements, losses (insensible and sensible), and pathophysiological changes associated with major bowel surgery. Restriction of fluid intake to bowel surgery patients after surgery has been shown to be beneficial (Patel et al. 2012). Nurses should ensure that the required amount fluids given are in balance with fluids lost, this helps to avoid fluid overload.

6.3.2 Enteral Nutrition

Patel, et al (2012) observed that, there is no specific advantage to withhold early feed within 24 hours after colorectal surgery—bowel surgery. They further argue that, early enteral nutrition⁶ has several advantages, such as improved healing of intestinal anastomoses, preservation of gut barrier functions, a positive nitrogen balance, improved calorie intake, a reduced incidence of infectious complications, and reduced hyperglycaemia and insulin resistance. Still, patients with early enteral nutrition had reduced length of hospital stay, thus reduction in septic complications. It is save, and more cost effective than parenteral nutrition⁷.

⁶ Enteral nutrition—also known as tube feeding, is a means of delivering nutrition directly to the patient's stomach or small intestine through a tube.

⁷ Parenteral nutrition—also known as intravenous feeding, is a means of delivering nutrition into the body through the veins or intravenously.

6.3.3 Patient Education

A nurse should ensure that the patient acquires the necessary information and knowledge to care for him/herself after discharge. After discharge, the patient will be responsible for managing his own care and wellbeing. Therefore, prior to discharge, a nurse should provide written, and verbal instructions on either wound care, colostomy, pouch management, skin care, irrigation, or nutrition to the patient. A patient should be allowed to practice ample time to practice changing pouch and skin care. Practice of skill improves learning and confidence. Good understanding of procedures and care enhances the ability to provide self-care as well as self-esteem and control (LeMone et al. 2011: 706).

Bowel surgery or colostomy patients have individualised diets, and may at times require an alternation or not. Therefore, when teaching on deity, the nurses should include foods that cause stool odour and, foods that thicken and loosen stools (LeMone et al. 2011: 706).

And a list of these foods should be given. Some of the foods that increase stool odour are; beans, cabbages, eggs, asparagus, fish, garlic, and onions. Some foods that thicken stool include; bananas, bread, cheese, yoghurt, rice, and creamy peanuts. More, foods that loosen stool include; chocolate, dried beans, fried and greasy foods, raw fruit juices and raw vegetables, and highly spiced foods. And food that increase intestinal gas include; beer, corn, cabbage, spinach, peas, cucumbers, dairy products and carbonated drinks. And lastly some foods that colour stool include beets and red gelatine (LeMone et al. 2011: 706).

7. Interpretation of Results

In this study, the aim is to analysing scientific articles, credible and reliable books, websites and other variable data sources in order to answer the posed research questions. The research questions in this study include: What are indications for bowel surgery? How does bowel surgery change nutritional situation of the patient? And what necessary steps should be taken to support, guide and educate the patient during hospital stay and discharge from hospital? From the theory and articles studied, a number of important themes emerged, of which included; bowel surgery, indications for bowel surgery, and nutritional support and guidance.

Jean Watson's Theory of Human Caring was presented as a theoretical framework in the study. Since the study focuses on bowel surgery, nutritional situation after bowel surgery, and patient care and education after the surgery, it was worthwhile incorporate the human caring part to the study. Surgery patients, and more specific bowel surgery patients would require care from preoperative state throughout the postoperative, until it they regain their independence.

The study is based on the concepts of bowel surgery and indications for bowel surgery, and after surgery nutritional situation and nutritional guidance as described by among others, Jorge & Habr-Gama; Patel, Lutz, Panchagnula & Bansal; Kesisoglou, Pliakos, Sapalidis, Degliannidis & Papavramidis; Fujioka, DiBaise & Martindale. This is reflected in Watson (2007, 2008) that nursing has immersed its scientific and artistic heritage in its scientific quest, and preoccupation with evidence-based practice.

The evidence based practice of which thrives on scientific knowledge is crucial for nurses, and their work with bowel surgery patients. In the study, it is observed that nurses not only require nursing care knowledge, but also, knowledge of body anatomy, in this case anatomy of the bowel (Jorge & Habr-Gama 2007: 14) and also knowledge on nutritional standards and values (Fujioka et al. 2011: 53S–54S) of which are crucial in the holistic care for a patient.

Nutritional guidance and support to bowel surgery patients could be successful when nurse inline of care take the holistic approach to the assessment process. When caring for bowel surgery patients, nurses should not only focus on pain alleviation and wound healing, but the general wellbeing of the patient. This is supported by Watson (1999) Theory of Human Caring of which suggests that guiding values of nursing is be preservation of humanity, dignity and fullness of self. The theory further extends into the nutritional assessment, it calls for the clinician, thus nurses to expand the plan for intervention outside of simply physical aspects.

Bowel surgery patients require nutritional support and guidance at the hospital and after discharge from the hospital. As Watson's Theory of Human Caring emphasises self-care and autonomy, a patient cannot fully care for her/himself without clear knowledge and information on what needs to be done and what needs to be eaten. Therefore, there is need for more information to be given to the patient to facilitate self-care, and enable a quick recovery and patient independence.

Although there is a scientific basis for the practice of nursing, it is the “body, mind, and spirit” of both the nurse and the patient that has the greatest impact on the outcome of the care (Childs 2006: 284). In this, it is crucial for the nurse to have knowledge and information regarding the given condition, in this case; nutrition, so that they could give proper guide and education to the patients. It is impossible for a nurse to provide patient education without the necessary knowledge.

In a holistic approach (Watson 1999) to patients’ care, her/his goal setting, and finally, her/his decisions regarding interventions and care must be explored. The nurse must have a deep appreciation of the patient’s definition of life; the quality of his life; and the things, actions, and events that make his life important. In case, the patients’ primary goal is to maintain a quality of life and secondarily a longer of life, therefore, the need to evaluate each recommendation in the light of how it affects the patients activities of daily living, the impact on her/his family, and to what end it will adjust the course of her/his therapy and, ultimately, her/his life (Childs 2006: 286).

8. Critical Review

This study was conducted in an ethical way of referencing by acknowledging the other writers' works. A qualitative study should follow ethical conduct and have to be trustworthy, and be able to be able *"to maintain high standards of integrity and avoid such forms of research misconducts as plagiarism, fabrication of results, or falsification of data"* (Polit & Beck, 2008, 191)

Polit & Beck (2012) state that the quality criteria most often cited by qualitative researchers are those that are proposed and augmented by Guba & Lincoln in 1985 & 1994. To develop the trustworthiness of a qualitative inquiry, four criteria were suggested; credibility, dependability, conformability, and transferability. All these four criteria represent parallels to the positivist's criteria of internal validity, reliability, objectivity, and external validity. Further, to respond to numerous criticisms, and to their own growing conceptualisations, a fifth criterion that is more distinctive within the constructivist paradigm was added: authenticity (Guba & Lincoln 1994, in Polit & Beck 2012: 584).

Valid and reliable data were collected from relevant and current scientific articles, peer reviewed books, and organised and analysed in qualitative analysis approach. As seen from (Elo & Kyngäs 2007: 112), proper content analysis requires the analysis and simplification of data and forming of categories that reflect the subject of study. Valid and reliable data gives credit to the study. Polit & Beck (2012: 584) refer to credibility as *"criteria for evaluating integrity and quality in qualitative study"* and, in addition, *"refers to the confidence in the truth of the data and interpretation of them"*.

9. Discussion and Conclusion

In this study, analysis of scientific articles and books to describe, and understand bowel surgery, propose a model through which care could be routed to help patient in post-surgery state at the hospital and after discharge. Bowel surgery is a wide scoop, but, this study was mainly focused to surgery of the large bowel and indication for the surgery. However, in general it incorporates complications of the whole bowel system and the possible management to those complication, and thus surgery and nutritional support and guidance after surgery.

In several incidences, health care personnel, nurses in particular, may lack an understanding regarding a specific condition, thus bowel surgery and may put less attention to the necessary needs in managing it. The significance of this study in reviewing and analysing studies made in areas of bowel complications, surgery and nutritional support is to provide an insight to the need for nurses to acquire knowledge and information regarding post- surgery nutritional support and guidance to bowel surgery patients.

In consideration of Watson's (1999) Theory of Caring, it is useful for the nurse to consider the curative factors described in Watson's theory. The growth of the helping-trust relationship between a nurse and the patient requires that the nurse be willing to support whatever decision the patient makes. When the evidence in favor of intervention or, otherwise, against nutrition support is offered to the patient, the patient and the patient's family will make a decision, weighing the evidence presented but also considering their values and belief

system. The helping-trust relationship between the nurse and the patient supports the patient's decision, regardless of what it is (Childs 2006: 286).

A number of articles analysed agree that bowel surgery affects negatively the nutritional status of a patient. Van Gossum et al. (2009) & Fujioka et al. (2011) all agree that micronutrient deficiencies occur in bowel surgery patients. Deficiency in mineral such as Vitamins (B12, A, D and E), and iron and calcium deficiencies are common accuracies in bowel surgery patients. All these could be due to extensive surgery, in which, large portion of bowel could be removed. Poor absorption of nutrients results from removal of portions of the bowel, there

In conclusion, for nurses caring for bowel-surgery patients, it is vital to be knowledgeable in areas of human anatomy, and nutrition care and management to enable a better patient support, guidance and education on nutrition management after surgery. A well-managed nutritional therapy due to clear and knowledgeable patient education does not only facilitate quick recovery and independence, but also reduces postoperative morbidity.

This study will be helpful in highlighting the need for nurses to have a well-planned patient education program specific surgical cases. It is also helpful to nurse in pointing out nutritional deficiencies that occur after extensive of which seem to be overlooked. The study answer the research questions of; what are the indications for bowel surgery? How does bowel surgery change nutritional situation of the patient? And what are the necessary steps a nurse should take to support, guide and educate the patient during hospital stay and after

discharge from hospital? And hopefully could be used in reviewing the need for a better patient education to bowel surgery patients.

This study gives general overview into bowel surgery and the necessity for patient support, guide and education after surgery. It provides an opening for research and new ideas to go on in the improvement of patient education after extensive surgeries.

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