Postoperative recovery: a concept analysis

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Abstract
Title. Postoperative recovery: a concept analysis
Aim. This paper presents a concept analysis of the phenomenon of postoperative recovery.
Background. Each year, millions of patients throughout the world undergo surgical procedures. Although postoperative recovery is commonly used as an outcome of surgery, it is difficult to identify a standard definition.
Method. Walker and Avant’s concept analysis approach was used. Literature retrieved from MEDLINE and CINAHL databases for English language papers published from 1982 to 2005 was used for the analysis.
Findings. The theoretical definition developed points out that postoperative recovery is an energy-requiring process of returning to normality and wholeness. It is defined by comparative standards, achieved by regaining control over physical, psychological, social and habitual functions, and results in a return to preoperative level of independence/dependency in activities of daily living and optimum level of psychological well-being.
Conclusion. The concept of postoperative recovery lacks clarity, both in its meaning in relation to postoperative recovery to healthcare professionals in their care for surgical patients, and in the understanding of what researchers in this area really intend to investigate. The theoretical definition we have developed may be useful but needs to be further explored.

Keywords: concept analysis, definition, nursing, postoperative, recovery

Introduction
A wide range of procedures are available to treat patients who require surgical intervention. An important part of the patient experience, irrespective of the type of procedure, is postoperative recovery. Research in this field is extensive and includes studies of postoperative recovery as an outcome measure, e.g. factors associated with length of hospitalization (Kehlet & Dahl 2003), specific surgical procedures (Bay-Nielsen et al. 2004), and the use of specific pain management techniques (Pavlin et al. 2005, Werawatgonon & Charuluxanun 2005).

The emphasis in qualitative studies is on patient experiences in postoperative recovery, and primarily factors associated with specific diseases, e.g. gastrointestinal cancer (Olsson et al. 2002), gastro-oesophageal reflux (Nilsson et al. 2002) and prostate cancer (Burt et al. 2005). Although postoperative recovery is commonly used as a concept, it is difficult to identify a standard definition. A conventional concept runs the risk of being used without reflection. Furthermore, different disciplines may attribute different meanings to the same concept.

Concept analysis is a means to clarify over-used or vague concepts that are prevalent in clinical practice, hence enabling
those using the term to perceive it in the same way. The purpose of concept analysis in nursing research is to examine the basic elements of a concept by revealing its internal structure and critical attributes (Walker & Avant 2005). Knowledge changes over time. Hence, the understanding of a concept should be considered as a dynamic, ongoing process that is responsive to new knowledge and experiences (Meleis 2005).

Early discharge from hospital requires patients to handle much of the postoperative recovery process on their own. Defining recovery from a holistic perspective is essential for nursing and for the advancement of postoperative care. Formulating a definition of postoperative recovery promotes understanding of its use in postoperative care and the factors that influence it. Therefore, the aim of this study was to present a concept analysis of the phenomenon postoperative recovery.

Methods

The scientific literature was searched to produce a definition that explains the concept of postoperative recovery. We searched the MEDLINE and CINAHL databases for English language papers published from 1982 to October 2005 that contained the following search terms: concept analysis, recovery, anaesthesia, anesthesia, postsurgical, postoperative, recovery process, post discharge, convalescence, rehabilitation used separately and in combination with each other. The reference lists of all retrieved articles were searched for additional studies. The papers included in the analysis described and highlighted the phenomenon postoperative recovery, i.e. the meaning of recovery. Papers were excluded for example, where intervention and descriptive studies used postoperative recovery as an outcome measure for pain, nausea, mobilization, etc. Dictionaries and textbooks were also searched for a definition of the concept. Walker and Avant’s (2005) approach to concept analysis was used as the method to define the concept postoperative recovery and a total of 26 publications, one textbook and two dictionaries were used in the analysis.

Findings

Dictionary and thesaurus definitions

Initial information about recovery was found in dictionaries and a thesaurus. The Encarta World English Dictionary, North American Edition (2005) defines recovery as:

The return to normal health of somebody who has been ill or injured, the return of something to a normal or improved state after a setback or loss, the regaining of something lost or taken away, the extraction of useful substances from waste or refuse (environment), the obtaining of something by the ruling of a court (law), a return to the guard position after making an attack (fencing), and the bringing forward of the arm to make another stroke (rowing swimming).

According to the Wordsmyth English Dictionary – Thesaurus (2005), synonyms for recovery are: recoup, salvage, return, convalescence and cure.

Uses of the concept

In ambulatory surgery, postoperative recovery can be divided into three phases: early, intermediate and late recovery (Steward & Volgyesi 1978, Korttila 1995). The early phase lasts from discontinuation of anaesthesia until patients have recovered their vital protective reflexes. The intermediate phase lasts from when patients have regained stable vital functions until readiness for discharge home. The late phase lasts from discharge until the patients reach preoperative health and well-being (Steward & Volgyesi 1978, Marshall & Chung 1999). Presumably, the three phases of recovery would also apply to hospital inpatients.

From a holistic perspective, postoperative recovery is described as a process defined by improvement in functional status and the perception that one is recovering (Zalon 2004). Another description is a return to wholeness that occurs by conservation of energy and reinstatement of integrity (Levine 1991). Pain, depression and fatigue are related to patients’ self-perceptions of postoperative recovery after abdominal surgery and after coronary artery by-pass graft surgery (Zalon 2004). Patients have also major concerns about returning to independence in activities in daily life (Kirkevold et al. 1996, Moore 1997). Physical sensations associated with fatigue, pain from chest and leg incisions, pain in shoulder and neck muscles, and pain while coughing are part of the recovery process (Moore 1997). Pain and fatigue are the most common and severe symptoms in postoperative recovery (Moore 1997, Hodgson & Given 2004, Zalon 2004, Nilsson et al. 2006) and indicate impaired structural integrity after surgery (Zalon 2004). According to Levine (1991), fatigue is a sign of limited energy resources, which is described as both physical and psychological energy loss (Nilsson et al. 2006). Postoperative fatigue may be caused by reduced energy and preoperative anxiety (Nilsson et al. 2006). Pain, depression and fatigue are also significantly related to functional status and self-perception of recovery in older postoperative abdominal patients (Zalon 2004). Psychological sensations, e.g. negative emotions including depression, anger and...
anxiety are also part of the recovery process (Moore 1997). Depression reduces the conservation of personal integrity and has been associated with lower functional status after surgery (Zalon 2004).

Signs of recovery include a continuous decrease in discomforting bodily symptoms (Olsson et al. 2002). Physical symptoms that overwhelm patients in the first months after surgery are described as a kind of prison (Olsson et al. 2002) and patients’ experiences from surgery can be an extensive personal shock (Theobald & McMurray 2004).

As a psychosocial phenomenon, recovery has been studied as abandoning the sick role (Parsons 1975). In a study by Kasl and Cobb (1966), recovery was associated with discharge, as an outcome measure for factors associated with the length of hospitalization. This study examined the sick role at a behavioural level, in which recovery was defined as leaving the sick role to resume normal social obligations. A decade later, a study of abandoning the sick role after cardiac bypass surgery extended the research beyond hospitalization, and recovery was described as returning to work (Brown & Rawlinson 1977). The psychosocial recovery process also involves interacting with other people and is more complex and time-consuming than recovery of self-oriented activities. Patients seem to focus on regaining physical, cognitive and practical functions before focusing on relating to others (Kirkevold et al. 1996). When an individual becomes disabled, it is expected that treatment will be sought. When this happens, the individual becomes dependent on others for care. After a shorter or longer period, caregivers help the patient develop the skills needed to take responsibility for self-care (Andreoli 1990, Nilsson et al. 2006). To optimize the recovery process, some patients require more detailed discharge information on what to expect after surgery (Theobald & McMurray 2004).

The availability of social support is important for psychological well-being during the recovery process (Baker 1990, Nilsson et al. 2006). Psychological well-being is influenced by met or unmet expectations, positive or negative physical symptoms and positive or negative feelings of personal competence (Baker 1990). This has also been shown to be a significant factor influencing functional recovery when controlling for age, comorbidities, site of disease and symptoms (Hodgson & Given 2004). Recovery can be described as regaining one’s optimum level of well-being (Andreoli 1990).

Baker (1989) conceptualized recovery as a phenomenon that extended beyond discharge. Postdischarge recovery was described as a process of returning to normal, as defined by pre-illness comparative standards of physical, social and psychological well-being. This process moves successively through three phases: passivity, activity resumption and stabilization. Passivity is a time of rest to support physical convalescence. During activity resumption, people prepare for their return to a full range of activities. Stabilization starts when they have returned to a full range of pre-illness, social role functions. Reasons for resuming, or not resuming, activity are dependent on cues and pressure. Those who experienced congruence of cues and pressures reported positive feelings about the recovery process. People who perceived negative physical symptoms, especially fatigue, and who were unable to respond to pressures, expressed frustration (Baker 1989).

The recovery process includes turning points, or recovery indicators, defined as recovery trajectories. ‘Critical junctions’ in the trajectory can be identified as either improvements or setbacks in relation to the expected outcome. The recovery trajectory is based on the belief that the patient will recover. There is a wide recovery trajectory, but also multiple smaller trajectories, e.g. concerning mobility and personal hygiene. Each particular trajectory corresponds with the progression and control of bodily functions as patients move towards recovery, and these shifts in control are defined as ‘recovery markers’. Recovery could be described as becoming independent and regaining control over one’s bodily functions and body care (Lawler 1991).

**Defining attributes**

Concept analysis requires the determination of the defining attributes of characteristics that are most frequently associated with the concept and appear repeatedly in references to it, according to Walker and Avant (2005). Based on their approach, the defining attributes of recovery after surgery are: (a) an energy-requiring process, (b) a return to a state of normality and wholeness defined by comparative standards, (c) regaining control over physical, psychological, social and habitual functions, (d) returning to preoperative levels of independency/dependency in activities of daily living and (e) regaining one’s optimum level of well-being.

Several dimensions emerge from the literature. The postoperative recovery process is divided into four dimensions, i.e. physiological, psychological, social and habitual recovery (Table 1). In physiological recovery, patients improve their functional status by regaining control over reflexes and motor activities, normalized and controlled bodily functions, loss of pain and fatigue and conservation of energy. Passivity is also a part of physiological recovery. Psychological recovery includes returning to psychological well-being and wholeness, reinstated integrity, transition from illness to health, loss of depression, anger, anxiety,
Lisa is a 47-year-old woman who had a hysterectomy to treat bleeding. There were no complications during anaesthesia and surgery, and the entire procedure went smoothly. Lisa woke up in a postanaesthesia recovery unit and was transported to the surgical ward a few hours later. Thanks to effective pain treatment she did not experience pain, but was bothered by mild postoperative nausea. She managed to drink and eat and made successive progress in mobilization, toileting, and personal hygiene. Before surgery she had been worried about her diagnosis. She feared that a cancer disease caused her symptoms. Afterwards, she was able to relax when a biopsy revealed no malignancy. Lisa was discharged from the hospital four days after her operation. At that time she did not experience pain or nausea, but was completely exhausted and had little muscle strength. She was happy to have her family, who supported her in practical activities, e.g. buying food, cleaning the house, and caring for the dog. Successively, she managed to return to the activities she performed prior to surgery. Four weeks after surgery she returned to work. By that time her wound was healed, and she had no remaining physical symptoms. She was satisfied with the outcome of surgery, as the bleeding had ceased. She was also relieved to know that she did not have cancer. Fatigue was the only remaining problem, since she was still tired and had little strength. She was unable to manage even minor tasks after coming home from work. This fatigue continued for about three months, after which she regained normal strength in relation to her preoperative standard and expectations.

This case demonstrates the defining attributes. Lisa’s recovery was a process over time. She achieved effective treatment for her physical symptoms. She experienced fatigue, which forced her to rest and conserve energy. Successively, she regained control over her physical and habitual functions. She managed to return to work and to various activities. Also, Lisa was happy with the result of her operation and felt relieved that she did not have cancer.

### Borderline case

Borderline cases are examples that contain most, but not all, of the defining attributes (Walker & Avant 2005), for example:

A 67-year-old man was in the garden with his wife and friends when he suddenly experienced intense stomach pain. His wife called for an ambulance, and he was taken to hospital. He was operated on immediately, and the surgeon found that he suffered a colon rupture caused by a tumour. During the early postoperative phase he experienced severe pain. He was also shocked by the fact that he had been operated on, and that he had a cancerous tumour. After a few days it became clear that he had a wound infection. He was very tired and had to remain in hospital for about two weeks. During this time he successively progressed regarding mobilization and intake of fluid and food. After discharge, he feared that something else could happen to the wound. He was exhausted and needed a great deal of rest. In the first weeks, before he had the courage to leave the house, he exercised indoors. Because of the cancer he required chemotherapy, which caused him considerable problems with diarrhoea and nausea. After six months he had regained control over his physical and practical functions and was able to return to independence in activities of daily living. However, because of the chemotherapy he had not returned to optimum psychological well-being. He experienced side effects from the treatment and was still bothered by the fact that he had cancer. He did not know what to expect in the future.
This man had reached the turning point for recovering physical and habitual functions, but had not recovered emotionally.

**Related case**

Related cases are similar to the concept and relate to it in some way, but do not contain all the defining attributes (Walker & Avant 2005). The following is an example:

A 39-year-old man was restoring his house. He was working alone when he suddenly fell from a ladder. His wife found him lying unconscious on the floor. An acute operation was necessary to stop the bleeding in his brain. After surgery, he successively regained control over physical functions. The process took several months. He needed considerable rest, but managed to return to independence in daily activities. The wound healed, and he does not have any residual conditions. However, this traumatic experience caused him to reflect. It brought out other issues that had nothing to do with the surgery.

This case is similar to the model case, but the process evolved beyond the specific recovery from surgery. He searched for meaning in his experience. The recovery process evolved into more of a healing process.

**Contrary case**

Contrary cases are examples of what the concept is not (Walker & Avant 2005). For example:

A 70-year-old woman was treated by knee replacement surgery. It was an elective procedure, and she was well-prepared both physically and mentally. The operation was performed using a combined spinal-epidural block. When the ward nurse was doing her routine postoperative monitoring on the first evening after surgery she discovered that the patient had a total muscle blockade. This appeared to be the result of bleeding in the epidural space. Surgery was performed, but too late to avoid tissue damage. The woman needed to spend the rest of her life in a wheelchair.

This case demonstrates the opposite of recovery. A healthy woman underwent elective surgery, which resulted in serious tissue damage. She did not return to a preoperative level of wholeness, but developed a new condition. Her situation was much worse after the operation than before.

**Antecedents and consequences**

Antecedents are those events or incidents that must occur prior to the occurrence of the concept (Walker & Avant 2005). With recovery in this context, the antecedent is surgery, caused by injury, illness or other factors. Surgery leads to physical, psychological, habitual and social interruption.

Consequences are those events or conditions that occur as a result of the concept (Walker & Avant 2005). Postoperative recovery is an energy-demanding process with turning points starting directly after surgery and extending beyond discharge. The intended consequence is to return to preoperative physical, psychological, habitual and social status, an optimum level of well-being, and preoperative levels of independence/dependency in activities of daily living. Lawler (1991) states that recovery means returning to independence and regaining of control over bodily functions. We think that a person needing assistance in activities of daily living can also recover, not to a level of independence, but to their former level of dependence.

**Empirical referents**

According to Walker and Avant (2005), ‘Empirical referents are classes or categories of actual phenomena that by their existence or presence demonstrate the occurrence of the concept itself’ (p. 73). In some cases, the empirical referents are identical to the attributes (Walker & Avant 2005). Several instruments are available that purport to measure quality of recovery after anaesthesia and surgery (Myles et al. 1999, 2000a, Myles et al. 2000b, 2001, Leslie et al. 2003). Also, several studies report on the development of instruments to evaluate the effectiveness of different interventions during the recovery period (Aldrete & Kroulik 1970, Wolfer & Davis 1970, Hogue et al. 2000, Kleinbeck 2000). Lee and Steven (2000) reviewed the literature to discuss and describe different approaches towards measuring recovery. They stated that recovery is a process occurring over several months, affected by factors such as adequate information; anaesthetic and surgical techniques; restoration of normal eating, drinking and toilet habits; loss of anxiety, depression or fatigue; mobilization and rehabilitation to full social functioning; and changing from a state of illness to a state of health (Lee & Steven 2000).

**Discussion**

A limitation in our study was the number of papers found, and presumably the papers not found, through our search strategy using search terms for postoperative recovery. Valuable information might have gone undetected. Another problem concerns synonyms. Convalescence is one of the synonyms for recovery, according to the Wordsmith English Dictionary. In a study (Jakobsen et al. 2003) aimed at
describing convalescence after laparoscopic sterilization, the data collected included time until return to work and performance of core activities of daily living. These parameters could also be included in the definition of recovery according to our concept analysis. Jakobsen et al. (2003) did not define or describe the concept of convalescence, but used different parameters as outcome measures for convalescence. Similar papers using the concept of convalescence, or other synonyms, were not included in our analysis. This also highlights the complexity of a concept analysis and the importance of describing the meaning of the different concepts used in research.

We used Walker and Avant’s (2005) approach to define the concept of postoperative recovery. This approach was useful because of the systematic method. We also think that, for the nurses in clinical practice, the cases clarify the complexity of the concept. However, it is important for all healthcare professionals to understand this complexity. Postoperative recovery is a process starting directly after surgery and existing beyond discharge and including different turning points; it does not only involve cessation of physical symptoms. Our definition of postoperative recovery has a holistic perspective, which helps the nurses and other healthcare professionals to support, treat, inform and understand surgical patients on their way back to preoperative levels of independence/dependency.

Although the scientific literature commonly refers to the concept of postoperative recovery, a theoretical definition of the concept is difficult to find. Hence, in this concept analysis, we aimed to formulate a definition of recovery in this specific context, i.e. after surgery. The attributes have been identified, four dimensions of recovery have been described, and the definition of postoperative recovery produced from this concept analysis is as follows:

Postoperative recovery is an energy-requiring process of returning to normality and wholeness as defined by comparative standards, achieved by regaining control over physical, psychological, social, and habitual functions, which results in returning to preoperative levels of independence/dependence in activities of daily living and an optimum level of psychological well-being.

According to Walker and Avant (2005, p. 64), a concept analysis should never be viewed as a finished product and ‘the best one can hope for is to capture the critical elements of it at the current moment in time’. We believe that the current critical elements of postoperative recovery have been captured in our definition. Our concept analysis could be a first approach in a theory-building process for postoperative recovery. A practice-oriented theory could, for example, be useful for nurses in clinical practice aimed at guiding actions in this complex area. Our ongoing research projects concerned with postoperative recovery will give more knowledge and should be useful in a future theory synthesis (Walker & Avant 2005).

### Conclusion

The concept of postoperative recovery lacks clarity, both in terms of what postoperative recovery means to healthcare professionals in their care for surgical patients, and in understanding what researchers really intend to investigate. The theoretical definition we have developed may be useful but needs to be further explored.

### Author contributions

RA, KB, EI and UN were responsible for the study conception and design and the drafting of the manuscript. RA and UN performed the data collection and data analysis. EI and UN provided administrative support. RA, KB, EI and UN made critical revisions to the paper. EI and UN supervised the study.

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