

# Design and Development of Kardex and Nursing Reports in the Rehabilitation Hospital

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## Abstract

**Introduction:** A nursing rehabilitation Kardex and reports could act as a framework to facilitate and organize rehabilitation programs.

**Objectives:** This study aimed to design a special Kardex and a structure to rehabilitation nursing reports.

**Methods:** This study was carried out in two phases consisting of literature review and Delphi method in Rofideh Rehabilitation Hospital, Tehran, Iran. In the first phase, a diverse literature review was done. PubMed, Elsevier, Web of Science, and Google Scholar as a search engine were searched using the keywords of Kardex, “nursing report,” “nursing note,” “nursing rehabilitation,” “nursing Kardex” from 2010 to 2020. After a literature review, the first draft of the Kardex was made. In the next step, using the Delphi method, the initial Kardex was sent to rehabilitation nursing experts in four rounds, and their comments were applied on that.

**Results:** The rehabilitation nursing Kardex was prepared after four rounds. The Kardex content included “Evaluation of nutritional needs,” “Requirements for daily living,” “Patients’ education,” “Examination of bedsores,” “Fall prevention,” and “communication with rehabilitation departments (physiotherapy, occupational therapy, and speech therapy).”

**Conclusion:** Rehabilitation Kardex and nursing report sample can be used as a suitable tool to promote patients’ independence in rehabilitation centers.

## Keywords

Kardex, rehabilitation nursing, nursing report, Delphi method

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## Introduction

Rehabilitation plays an essential role in maintaining the independence and quality of life of injured patients (Camicia et al., 2014). An early rehabilitation program can help to preserve performance and increase the chances of recovery to the earlier function level (Mauk, 2018). A rehabilitation nurse is a specialist nurse who helps people with disabilities to achieve their former function or move towards independence and adapt to a new lifestyle (Camicia et al., 2014). Moreover, a rehabilitation nurse provides direct care and services to people suffering from physical and mental disorders and also assists family members to find supports for their patients (Ismail, 2021; Mauk, 2018). They cover various services in the hospitals, home care centers, outpatient rehabilitation clinics, or drug abuse treatment settings (Martin et al., 2011).

## Review of Literature

The specialized responsibilities of a rehabilitation nurse include (1) Assessing the major concerns, limitations, needs, and potential abilities of the client and their families,

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(2) Planning based on resources and support, (3) Performing to promote the health and performance of the client in all physical, mental, and social dimensions, (4) Improving quality of life and positive adaptation, and finally (5) counseling, training, and care to meet the needs of the client (Kirkevold, 2010). The quality of the rehabilitation process depends on the full medical supervision, accurate and complete cares and treatments, the degree of interdisciplinary collaboration, and rehabilitation programs tailored to realistic goals (Kirkevold, 2010). Rehabilitation nurses, in addition to specialized services, also have the duties of a general nurse (Ismail, 2021).

Nursing documentation is one of the most important nursing duties worldwide. Further, it is a tool to utilize nursing theories in practice. These documents include the nursing reports and the Kardex (Paans et al., 2011). Kardex is a nursing worksheet that includes a summary of patient information, such as prescribed medications, clinical follow-ups, and daily care schedules. This worksheet is a sheet that is defined for each patient and is filled in at the time of patient admission and is updated after each visit until the patient is discharged (Chanyagorn et al., 2016).

The Kardex is a valuable tool that makes patient information accessible concisely (Namnabati et al., 2017). This worksheet includes the patient's demographic information, patient's diagnosis, medications, patient's health status, schedule of treatments, permitted range of motion and patient activity, and care plans. When shifts change, nurses use Kardex to provide patient information and follow-up to the next shift nurse. Although Kardex contains the most essential patient information, it has not covered the patient's clinical condition yet (Chanyagorn et al., 2016; Mount-Campbell et al., 2020), while its comprehensiveness is one of the essential elements in assured quality care (Ang, 2019).

Documentation is one of the core competencies in nursing and is also crucial for patients' wellbeing (Paans et al., 2010). Hall et al. showed that patients' poor safety could be because of weak nursing reports (Hall et al., 2016). Documented nursing reports are considered the most important data that can be used by health care providers and researchers (Tajabadi et al., 2020).

Rehabilitation programs as an important therapeutic goal help patients become more independent; leave the hospital earlier, and endure less financial burden (Sutton, 2017). Therefore, by emphasizing to their remained capabilities, their independence should be strengthened as much as possible to achieve self-sufficiency in self-care. Given these goals, designing a special Kardex for clients who have undergone rehabilitation programs seems to be necessary for promoting the level of independence (Mount-Campbell et al., 2020).

In addition, no gold standard tools are used to measure the accuracy of nursing reports. Appropriate nursing reports allow nurses to evaluate patient outcomes as a result of the nursing process. Studies have shown that nursing reports can be used as an international data resource (Ackley et al.,

2019; Doenges & Moorhouse, 2012), whereas, in the rehabilitation nursing report, nursing diagnoses, signs, and symptoms, therapeutic interventions, and their consequences are poorly documented in patients' records (Akhu-Zaheya et al., 2018). Given the role of standard nursing reports in improving the quality of patient care and establishing interdisciplinary communication, its standardization seems to be necessary (Paans et al., 2010). Therefore, the authors aimed to develop a Kardex and a framework for nursing reports in Rofeideh Rehabilitation Hospital.

## Materials and Methods

### Design

The present study was conducted in two phases of the literature review and Delphi method.

In the first phase, PubMed, Elsevier, Web of Science, as well as Google Scholar as a search engine were searched using the keywords of Kardex, nursing report, nursing note, nursing rehabilitation, and nursing Kardex, from 2010 to 2020. After identification of primary studies, the abstracts were screened and then the eligibility of the full text of the relevant studies was assessed. Data of the included articles were analyzed and the primary Kardex was formed.

In the second phase, a Delphi method was run. To extract the main themes from the first round of Delphi's member's comments, the content analysis was performed. In the second round, the items were ranked quantitatively. In the third and next rounds, the index of central and dispersion were utilized.

### Research Question

What dimensions and areas does a nursing cardex for a rehabilitation patient include?

### Data Collection

Totally, the process of the second phase was as follows: first, an executive team comprising faculty members of the rehabilitation specialists, and rehabilitation nurses was formed to monitor the Delphi process, then three panels were directed. In the first round, the primary Kardex delivered to members to assess its simplicity, clarity, and ambiguities; then the answers were analyzed and the members' comments were exerted; the revised Kardex and a sample of the nursing report were made and again referred to the members; the members' comments were analyzed and applied to the Kardex and the nursing report, and finally, in the third round, the Kardex and the nursing report were sent to the members further and the received comments were utilized. The process was continued and lastly, at the seventh round, showed an agreement. Afterward, one ward of the hospital was selected as a pilot sample and the Kardex and the sample nursing report were used. Then, the nurses'

comments were applied and the Kardex and the sample nursing report were finalized.

## Results

Of the 45 identified articles, 36 studies were excluded because of their inconsistency with the inclusion criteria and finally, 9 primary articles were analyzed. All analyzed articles were published in English-language journals. Based on the results of extensive search in different databases, concepts such as examining patients' nutritional status and body mass index, patients' wound and type of dressing used, patients' educational needs during and after discharge, type of rehabilitation provided, activities of daily living (ADL) and score obtained from ADL during the rehabilitation period, type of interventions performed for patients, and their pain status with visual criteria scale (VAS), were the items that in addition to the routine nursing measures (such as checking vital signs and level of consciousness), were necessary for the daily evaluation of patients' rehabilitation, and those should be included in the patient's daily Kardex. Therefore, the mentioned items were entered in the designed initial Kardex.

In the second phase of the study and at the first Delphi's round, the initial draft of Kardex was sent by email to the members of the Delphi group including rehabilitation nurses, and then their feedback was received and analyzed (Table 1). According to experts, the pain assessment of rehabilitation patients was not practical, so it was omitted.

The categories of "patient's verbal and communication status," "ADL score," "patient's movement status (CBR/RBR)," "patient's wound depth," "grade, size, and type of dresses," "patient's defecation situation," "sleep condition," "time of rehabilitation program," "diet," "patient training" were extracted from the member's opinions. In the second round, the second version of Kardex was distributed among the members too. The answers again were analyzed. These steps were continued until the stability of contents of the Kardex was obtained. Eventually, the final version of the Kardex was approved (Table 2).

Simultaneously with the Kardex preparation process, in order to define the content of the nursing report, the use of Kardex items and literature review, the following important items including "type of diet and the amount of patient's tolerance for it," "BMI," "type of wound with dimensions," "dressing status in each work shift," "the time of physiotherapy and occupational therapy," "pain intensity using VAS," and "the patient's learning needs" formed the primary structure of the nursing report (Table 3).

In the next stage, the nursing reports were evaluated in the research committee meeting. After applying the comments, the last version of the nursing report was finalized (Table 4).

## Discussion

The present study was conducted to design a Kardex and specific rehabilitation nursing reports. The designed Kardex has

several sections, including personal information section, ADL, wound care and type of dressing, interventions and their times, rehabilitation (physiotherapy, occupational therapy, and speech therapy), counselors, radiology, laboratory tests, daily rehabilitation visits, need assessments, and training during the inpatient and discharge times.

Besides the demographic part, patient's BMI, duration of hospitalization, Braden and Morse criteria, cognitive score, as well as the coordinator nurse were also located. According to the results obtained from the present study, one of the main needs of patients in need of rehabilitation is their dietary problems, which can be identified by a nurse while assessing their BMI and nutritional status and if needed, it could be arranged to visit patients by a nutritionist. Psychosocial complications such as depression and social isolation induced by disabilities and background chronic diseases can lead to malnutrition. Depressed mood is directly related to reduced nutrient intake (Nip et al., 2011) thus this result is in line with previous studies. For example, Sato et al. (2019) reported that prevalence of malnutrition was 42% at admission and 76% at discharge (Sato et al., 2019). Nutrition plays an essential role in improving the quality of life of patients and has been associated with reduced morbidity and mortality as well as appropriate rehabilitation (Wakabayashi, 2017). Therefore, according to the previous studies, it is clear that the assessment of the nutritional status of the rehabilitation patient by nurses can prevent the progress of their maltreatment, thereby resulting in effectiveness of rehabilitation process.

Another result obtained from our study was the presence of a coordinating nurse. Coordinated care can enhance safety, efficiency, quality of care, and health care outcomes, which is in line with the client-centered care. A well-knowledge nurse is one of the best people in health professionals who can coordinate, support, and facilitate transferring patients from hospital to home (Chou et al., 2013). Similar studies in this field showed that a rehabilitation nurse is a professional nurse who has many competencies and these competencies are used for the client, family, and community who need rehabilitation services. A nurse as a member of the rehabilitation team should have a holistic view of the client (Martin et al., 2011). The role of the caregiver is important to the rehabilitation nurse, but because the focus of rehabilitation is on helping the patient to maintain maximum health, the role of the caregiver usually focuses on educating the patient and family (Kirkevold, 2010). The close nurse-patient relationship has made the nurse in the rehabilitation team play a vital role in helping to meet the short-term and long-term needs of the patients and families. In many cases, the nurse has a coordinating role in the rehabilitation team (Ismail, 2021).

The next parameter resulting from our study was the ADL needs. ADL includes seven main functions composed of eating, dressing, moving, walking, urinating and fecal controlling, bathing, and going up the stairs. Each of these abilities is determined based on doing it independently. The



**Table 3.** The Primary Format of the Rehabilitation Nursing Report.

Nurses' reports	Medicines	Time	Date
<p>The client is Mr./MS. .... years-old with a diagnosis of .... which hospitalized in the service of Dr. .... The patient can communicate visually and verbally and is calm in terms of mood. Regarding the implementation of the instructions of the rehabilitation team, the client shows appropriate collaboration. The RBR / CBR order is performed by the patient. Bedsore/sores with the size and depth of .... and .... were observed in the area of ....., respectively. Daily washing and dressing of the wound/wounds was/were done with .... Concerning the wound prevention, self-care training was provided using the face-to-face method, educational video, and Pamphlet. Due to the patient urinary incontinence, a Foley catheter was fixed. The color (yellow) and volume of urine (l cc/Kg/minute) are acceptable and in the normal range. Necessary instructions were provided regarding the care and hygiene of the perineal area. About the defecation, the client has regular bowel movements. For the diet, a high-fiber diet with adequate fluids is commensurate with the patient's output. The rhythm of sleep and wakefulness is regular and there are no complaints of insomnia or frequent awakenings at night. The client was delivered to .... shift with stable hemodynamic status.</p> <p>Nurse signature</p> <p>Date/time</p>			

**Table 4.** The Final Form of Rehabilitation Nursing Report.

Nurses' reports	Medicines	Time	Date
<p>The client is Mr./Ms. .... years-old who diagnosed with .... and is in the service of Dr. .... Mr./Ms. .... was shifted us with BP of ..., HR of..., RR of ....., and temperature of .... The patient can communicate visually and verbally and is calm in terms of mood. Regarding the implementation of the instructions of the rehabilitation team, the client shows appropriate collaboration. The client is semi-independent and CBR/RBR, in terms of ADL and movement, respectively. Grade .... bedsore/sores with the size and depth of .... and .... was/were observed in the area of ....., respectively. Daily washing and dressing of the wound/wounds was done with .... Concerning the wound prevention, self-care training was provided using a face-to-face method, educational video, and Pamphlet. Rehabilitation exercises were delivered for .... minutes by a physiotherapist and .... minutes by an occupational therapist at .... am/pm. Due to the patient urinary incontinence, a Foley catheter was fixed. The color (yellow) and volume of urine (l cc/Kg/minute) are acceptable and in the normal range and CIC (clean intermittent catheterization) was done. Necessary instructions were provided regarding the care and hygiene of the perineal area. Regarding the defecation, the client has a regular bowel movement. For the diet, a high-fiber diet with adequate fluids is commensurate with the patient's output. The rhythm of sleep and wakefulness is regular and there are no complaints of insomnia or frequent awakenings at night. The client was delivered to the next shift with BP of ..., HR of..., RR of ....., and temperature of.....</p> <p>Nurse signature</p> <p>Date/time</p>			

amount of work needed to perform each of these activities is used to determine the level of care (Bland et al., 2020). A previous study indicated that having an ADL schedule and completing it by the nurse as well as a weekly assessment of ADL needs will help the rehabilitation nurse to follow the patient's level of independence. According to the Langhorne study, the nurse is responsible for maintaining the patient's physical and cognitive integrity and preventing secondary complications after injury (Langhorne et al., 2011). Given that the main purpose of rehabilitation nursing is to bring the disabled person to a degree of independence to have the desired social, psychological, economic, and family functioning, so it is necessary to pay special attention to patients' ADL.

The next item designed in Kardex is the Braden scale to assess the likelihood of bedsores. They are a common complication caused by direct and prolonged pressure on the arterial capillary system (Chou et al., 2013). The main groups at risk of developing pressure ulcers include patients with spinal cord injuries, elderly population, hospitalized patients, especially those undergoing orthopedic surgery, and patients admitted to intensive care units (ICU). Pressure ulcers usually cause pain, depression, decreased function, sepsis, which can increase the patient's length of hospitalization (Šáteková et al., 2017). Other studies conducted in this field also proved the finding that one of the important tasks of nursing is to assess the likelihood of pressure ulcers,

which can be done using a valid scale. Nowadays, there are at least 40 tools, of which only six scales have psychometric analysis reports (Charalambous et al., 2018). The Braden scale is one of these standard tools (Soozani et al., 2011). Prevention of pressure ulcers begins with patient evaluation in the early stages of nursing care. Therefore, a systematic assessment is necessary at the admission time or the time of any significant changes in the subject's condition. Besides pressure ulcers, assessing patients' risk of falls using Morse criteria, and cognitive state can help prevent further bedsores (Chou et al., 2013).

A rehabilitation nurse, as the team coordinator, should be aware of the patient's daily physiotherapy and occupational therapy programs, and based on patient's physical condition and daily assessment or consultation with the rehabilitation team, he/she should prepare the daily physiotherapy and occupational therapy programs for the patients. Similar studies also confirm that the rehabilitation nurse is not only patient's clinical nurse but also he/she must be actively involved in the implementation of rehabilitation programs.

The nursing reports format was adjusted based on the designed rehabilitation Kardex. Nursing records are another important and written document in a patient's medical record. The nurses' reports in the file show the process of medical treatments and nursing care and the patient's reactions to this care (Ang, 2019). In line with the results of our study, another study also demonstrated that nursing records have several advantages, including involving members of the health care team to continue holistic patient care, maintain some basic information, determining treatment costs, and research purposes. Nursing reports are an important tool for evaluating treatment and care, as well as demanding the legal rights of patients and nurses (Akhu-Zaheya et al., 2018).

In Jasemi et al. (2012) study, most of the nursing reports were not written based on the nursing process and had low quality. Nursing reports should cover all patients' needs. Therefore, the rehabilitation nurse can use the nursing documentation to identify the different dimensions of the patients' needs and take action to meet them (Jasemi et al., 2012). Nursing documentation plays an essential role in the coordination of team efforts, using the professional knowledge of other healthcare workers, improving the quality of delivered cares, and appraising. It also enables rapid diagnosis of patient conditions and also enhances nurses' skills in providing better care programs (SedighGharehUneh et al., 2017).

The quality of medical care depends on complete medical supervision, accurate and complete care, interdisciplinary collaboration, as well as defining of rehabilitation programs with clear and realistic goals. Therefore, by providing accurate nursing documentation a rehabilitation nurse can communicate with other team members to achieve a proper result.

## **Strengths and Limitations**

Nursing Kardex is a tool that every nurse can consider as his/her own and communicate with other treatment teams based on it. The need for a quick reference of patient and care information brought the integration of the nursing Kardex into the clinical setting. The current study is the first of its type in nursing rehabilitation Kardex. The samples are representative for the chosen patient population. According to the reviewed studies, all dimensions of patient rehabilitation are included in the designed Kardex and a comprehensive examination of the patient will be carried out. Conduction of the study only in one hospital is considered as a study limitation, however the Rofeideh Rehabilitation Hospital is the only rehabilitation hospital in Iran. As a result, low sample size was studied and it was not possible to evaluate Kardex in high sample size. Therefore, it is suggested that the developed Kardex should be examined on rehabilitation patients in larger sample sizes and different cultures. This new Kardex needs pilot studies to address all the shortcomings of the designed Kardex. Also, further research with a control site is required to validate the effect of the new Kardex on improving patient care and care experiences.

## **Implications for Practice**

Rehabilitation patients need long-term and comprehensive care due to the chronic nature of their disease. Rehabilitation nurses should have the necessary knowledge about their patients before they can safely and efficiently provide nursing care. The rehabilitation nursing Kardex has been instrumental on how nurses manage information—both during change-of-shift reports and in the actual provision of patient care. It serves as a reference tool and is one of the forms of communication where patient information is documented, such as patient identity, attending physicians, evaluation of nutritional needs, requirements for daily living, patient education, examination of bedsores, fall prevention and communication with rehabilitation departments (physiotherapy, occupational therapy, and speech therapy). The Kardex can also be used as a guide for making nursing assignments and estimating nurse-to-patient ratio needs on a particular unit.

## **Conclusion**

In the present study, a special Kardex was designed for the rehabilitation patient, which includes nutritional needs, daily living requirements, education during hospitalization and discharge time, examination of bedsores, risk of falling, and communication with the rehabilitation team (physiotherapy, occupational therapy, and speech therapy). Based on this Kardex, a sample of rehabilitation nursing reports was prepared. The roles of the rehabilitation nurse in the health care system vary from helping the patient to achieve the desired outcomes to case management of the

patient. The use of skills and experiences related to the patient and his family, making relationship among the rehabilitation team and the patient, as well as education are the responsibility of the rehabilitation nurse.

Rehabilitation nurses help the clients to be adapted to the limitations and lifestyle changes, while also providing a therapeutic environment for the clients and their families. Rehabilitation nurses design and implement the treatment strategies based on nursing theories including self-care theory, thereby promoting patients' physical, mental, and social health. They also provide direct care and education to the patients in subjects of sleep, nutrition, safety, skin care, bladder, and bowel function, maintaining the residual function, and complications. In the developed Kardex all the mentioned cases could be assessed, and in case of any problems, care plans could be implemented. Providing a dedicated Kardex for rehabilitation patients who have different needs from other patients and recording a nursing report based on Kardex items can lead to optimal, comprehensive, and patient-centered care.

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The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.


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### Ethical Approval

This study was approved by the ethics committee of the University of Social Welfare and Rehabilitation Science (USWR) with the cod number of IR.USWR.REC.1399.100.

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