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PRESENTATION by D. Hunstein, Y. Dintelmann, B. Sippel

Developing a screening instrument as a standardized assessment of signs and symptoms concerning basic nursing care needs in hospital nursing care

Since several years there has been a consensus on the need for standardised data in nursing in order to prove its success and to calculate and to explore it.
In Germany, the only standardised data on nursing stem from PPR, an instrument which has been developed in the early 1990's to calculate the manpower requirements in hospitals. This system has been abolished after being in operation for only three years. The main reason for abandoning the system is that the PPR system was calculating more nurses than actually could be funded. More fundamentally, the PPR system lacks any scientific rationale for validating these results.
In Germany, however, potential contents of Nursing Minimum Data Sets or the standardised measurement of patients' conditions have only been discussed in academic spheres so far. In nursing practice, however, these issues play almost no role – at least not ubiquitously.
There are indeed several approaches to realize nursing diagnoses in Germany. But the instruments necessary to diagnose are not available. Therefore, a peculiar development has taken place in Germany: The diagnostic process goes backwards:

First, the titles of the nursing diagnoses are examined to see if one of them might fit. Then you check if the listed characteristics (or signs and symptoms) are met by the patient. You could almost say that the characteristics take on the role of an assessment instrument in the sense of a procedure of exclusion, this is "characteristic prevails" or "characteristic does not prevail".

[FOLIE: EPA© - OBJECTIVES]

A correct diagnosis, however, requires the coverage and examination of a nursing problem in all its complexity. This data collection then comprises more than just checking the occurrence of signs and symptoms that are listed for particular nursing diagnoses.
We hold the view that a data collection remains arbitrary as long as it depends only on the knowledge and/or the experience of a nurse. Only the use of assessment instruments can make sure that all aspects relevant for the diagnosis are covered. Appropriate assessment instruments, which have been developed for the in-patient acute care barely exist in German-speaking countries. The existing instruments are either not theory-based, not sufficiently operationalized or not applicable.
In view of the complexity of nursing it also seems impossible to include all potential nursing incidents with one single assessment instrument.
Therefore we have decided - for the acute clinical setting - to take the first step of the diagnostic process by using a screening instrument. On the basis of the screening results, the subsequent differential diagnosis is introduced via in-depth assessment instruments and the nursing care processes are managed accordingly.
Such a screening instrument, the outcome-oriented nursing assessment – we name it "ePA©" (from the German "ergebnisorientiertes PflegeAssessment") – is currently being developed at the HSK Dr. Horst Schmidt Klinik Wiesbaden in cooperation with the University of Witten/Herdecke. We are a 1.200 beds acute care community hospital with 4 connected nursing homes and an outpatient ambulant nursing service. The ePA©-research project is supported by the German Nursing Council.
The development is not yet finished. In this presentation, the current status is presented.

The conception of ePA is based on a fully standardised assessment of the most important signs and symptoms of nursing care dependency in the acute clinical situation. With the assessment of signs and symptoms the basic data for the first step in the diagnostic process are collected.
The standardisation allows for weighting the extent of the several items through numerical values.
Apart from the advantage of the easy evaluation and comparison of these data per computer, the following differential diagnoses are controlled via score-systems and Cut-Off-Points, from which clinical guidelines are derived.
One example for the sake of illustration: a Body Mass Index of 19, a reduced nutrition of less than 1.200 kcal/day, and a weight reduction of 5% over the last three months might indicate malnutrition.
If for the respective items the relevant score combinations are reached, an appropriate guideline should be activated, the first step of which would be the differential diagnosis of malnutrition.
Several risk assessment instruments are integrated into ePA©. In addition to existing established instruments on the risk of pressure ulcer and the risk of falling, an in-house-developed instrument on the risk of problems in post-discharge care is included. The so-called „CaseManagementScore“ will be shortly mentioned afterwards.
Since the patients are assessed at several measurement times, processes can be very well illustrated.
Selected nursing-sensitive outcomes can be evaluated by comparing the risk with the (ideally) not occurred incident. In that manner, data on the occurrence of unintended harms like a pressure ulcer or a fall are gathered in the routine care process.
At last, the standardised data can be used to provide epidemiological data of care dependency in acute care hospitals.

[FOLIE: EPA© - DEVELOPMENT I]

The development of ePA© occurred in several steps:
After an analysis on the literature about care dependency selected assessment instruments and scales were examined for content, feasibility, scientific rationale and their ability to measure nursing care dependency with special regard to nursing specific outcomes.
Our aim is to develop one instrument for measuring the most important characteristics of nursing care dependency in the acute care setting. This should also be able to include the areas of risk diagnostics, prevention and selected nursing-sensitive outcomes.
The analyzed instruments were only partially applicable, which justifies the development of a new instrument (Streiner & Norman, 2003).
In controlled group discussions important care-inducing signs and symptoms, incidents and outcome dimensions of nursing care activities where elaborated.
Apart from reliability and validity, the feasibility of an instrument is another important quality criterion. (cf. Polit & Hungler 1999).
During the elaboration of ePA© a continuous alternation between theoretical development and practical testing has therefore been operated.
After a first pretest at two wards, a gastro-enterological and an accident surgery ward, the first draft of the ePA© has been reviewed.
A more widespread use in our clinic followed. Since a bit more than a year, ePA© has been introduced in a growing number of wards, 14 wards currently use it. Next to the individual training for its application, the use of ePA© is regularly discussed on the basis of real cases within the nursing teams on the wards.
The insights gained here are continuously analysed and integrated into the system. This process is set to continue until conclusion of the theoretical foundation at the end of Mai.
For the backing and the complementation of the theoretically elaborated items, the triggers of nursing activities are analysed on the basis of real nursing situations.

For this, the specialised nursing terminology European Nursing care Pathways ENP® (Wieteck 2005) has been used.
In order to cluster the totality of the 557 very differentiated ENP®- nursing diagnoses for our analysis, they have been mapped with the main characteristics from Gordon-nursing-diagnoses (Gordon 2000). This has led to the identification of 67 Gordon-nursing-diagnoses.

[FOLIE: GORDON-DIAGNOSIS]

In the next step, the frequency of occurrence of the mapped Gordon-nursing-diagnoses in more than 100.000 ENP®-nursing diagnoses from over 10.000 hospitalised patients was calculated. As you can see, most of those diagnoses are directly or indirectly influenced by limitations of mobility – no astonishing finding, but it reveals the interdependence of impairments.
The frequency of the diagnosis „Knowledge Deficit", however, is striking. This essentially reflects an information need concerning incontinence and the impact of surgeries.
In the next step, the ePA© items were compared with the main characteristics of the Gordon-nursing-diagnoses. It has become apparent during the analysis that the main characteristics of the most frequent Gordon-nursing-diagnoses reappear in the ePA©. The nursing diagnoses underrepresented in the ePA© ('Pain' and 'Breathing Pattern: Ineffective') are currently being reviewed.

[FOLIE: EPA© - DEVELOPMENT]

A further step was the development of the Case-Management-Score (CMS).
The Case-Management-Scorte is a newly developed risk assessment instrument which is supposed to measure potential problems in post-discharge care. This is how, in the field of nursing, we comply with the directives of the German Network for Quality Control, according to which an assessment of potential problems in post-discharge care must be realised within the first 24 hours.
The selection of the items took place on a theoretical basis: the criteria required for granting services of the German Long Time Care Insurance have been used. Those criteria are mainly oriented towards functional abilities. One fundamental critique of the assessment criteria of the Long Time Care Insurance consists of the insufficient consideration of cognitive alterations. In order to take account of this important care-inducing factor within the screening process, a corresponding item from ePA© has been added, namely learning aptitude.
Out of the total of 10 items, score values between 10 (maximally limited abilities) and 40 (complete autonomy and self-care in the respective domains) can be obtained.

[FOLIE DEVELOPMENT CMS]

For the determination of the Cut-Off-Point, 153 patients have been assessed in a prospective study as well with the ePA© as with existing Case-Management-Tools and experts' opinions. These instruments served as a sort of "gold standard".
The actual occurrence of the predicted event has been registered on the basis of the use of post-hospitalisation services.
In the first field phase of the ePA©-development, sensitivity, specificity, likelihood and accuracy of the CaseManagementScore were computed with a fourfold table and a preliminary Cut-off-point was determined. It currently lies at 31 points.
If a patient achieves 31 points or less, there is a high probability of actual nursing problems after discharge. In the current field phase, this value is already being used efficiently for process management. As soon as the verification of the interrater-reliability of the whole ePA© – scheduled for the end of this year – is concluded, the Cut-off-point shall be verified by use of a larger sample.

When interpreting the ePA© score values, you must consider that the items are only ordinal scaled. A simple addition of ePA©-points must therefore be regarded with caution. Increasing (or decreasing) values can only represent a trend. As soon as comprehensive data sets are available, however, an interval scaling could be applied. A similar approach has been used for the realisation of the Functional Independence Measure FIM.
How does the ePA© actually look like?
The ePA© is a fully standardised screening instrument. Currently, 45 items are assigned to 10 main categories.
It is mainly the abilities of patients and their conditions that are registered, like for example the ability of locomotion as well as the state of consciousness.
The items are scaled from 1 to 4, where 1 stands for maximally limited abilities or the worst physical conditions, and 4 stands for maximal abilities or the best physical conditions.
The items are operationalised through observable signs and symptoms. At the operationalism, specific attention has been paid to the establishment of practical and unambiguous descriptions and measurement quantities of the items.
This shall be illustrated by one example of an operationalism of a limited ability: "Patient needs manual assistance by leading spoon or fork to mouth" or „Patient needs assistance for putting the food onto the fork.", which corresponds to the value "2" in the ePA©.
The situations are, where possible, also associated with unambiguous units of measurement: "eats regularly not more than half of his meal and/or ingests overall not more than 1.200 kcal/day".
It has been shown in the testing, that the extreme values 1 and 4 are easy to measure. For the intermediary values of 2 and 3, detailed explanations are sometimes necessary.
Within the ePA© the screening is combined with a selected risk diagnosis. Thus items from the following risk scales are included in ePA© :

- Pressure Ulcer (Braden-Scale: Bergstrom, Braden et al. 1998),
- Risk of falling (STRATIFY: Oliver, Britton et al. 1997)
- Potential problems in post-discharge care (Dintelmann & Hunstein 2003)

For the assessment of the state of consciousness, the Glasgow-Coma-Scale is integrated.
In addition, risk factors for malnutrition and nosocomial pneumonia are assessed.
As soon as a larger scope of ePA© data are available, it will have to be checked if further risks of undesirable harms can be derived.
The first assessment with ePA© must occur within the first 12-24 hours after hospitalisation. Repeated assessments take place when the situation of the patient has changed and when this changed situation remains in place for more than 24 hours, as well as within predetermined intervals.
At last, a finishing assessment is done at the day of discharge. Thus a comparison of abilities and conditions over the whole period of care is possible.

[FOLIE: MARIA S., 84 YEARS]

With the following example I would like to show you how the ePA© can be used:
Mrs Maria S. is 84 years old. Although she still lives at home, she has growing difficulties to take care of herself because of degenerative alterations
Sometimes she forgets to take her medicine against her increased blood sugar level.
Since she has fallen down, she got a complicated fracture of the radius head.
During her stay at the hospital, several nursing diagnoses have been established, which are listed here in abstracts. On the next slide, we will see how her stay in the hospital is reflected in the CaseManagementScore and which actions have been taken on the basis of ePA©-trigger points.

[Folie: „exemplary case progression]

At home, Maria was still more or less able to take care of herself.
At the moment of her hospitalisation, she is strongly limited in her self-care by hefty pains. With 27 points, her CaseManagement Score is below the Cut-off-Point of 31. Therefore, the CaseManager is informed directly at her hospitalisation in order to clarify how the post-acute care can be assured.
After the screening it is striking that she has lost almost 5 kg of weight during the last three months and – despite of encouragement – drinks almost nothing.
Her Body Mass Index is 19, therefore an in-depth nutrition assessment is introduced, and the nursing diagnosis „Fluid Volume Deficit“ as well as „Nutrition, less than Body Requirements“ is established.
At the day of surgery, her abilities strongly collapse because the surgery has taken longer than expected and she awakes only slowly from anaesthesia. Moreover, a post-surgery confusion occurs.
Because of the limitations induced thereby, her Braden value has fallen far below 16 points, and the management of the Pressure Ulcer Prophylaxis begins. In addition, actions are taken to prevent an additional fall.
At the day 1 and 2 after the surgery, her abilities rise again,
deteriorate, however, on the third day because of fever. She needs comprehensive assistance, in particular in the domains of cognition, personal hygiene and mobility.
However, because of sufficient supply of liquidity, Maria recovers quickly, her memory improves (it was not a dementia, but a consequence of insufficient provision of liquidity!).
On the 7th day, her self-care abilities are essentially limited by the pre-existing chronically-degenerative changes as well as her plaster, such that she can be discharged with ambulant assistance for body care and home maintenance.

[Folie: „Objectives achieved“]

Let’s take another look at the slide I have shown you in the beginning:
We have obtained comprehensive standardised data on relevant triggers on Maria’s nursing care situation. In the curve on the last slide you only saw the score-sum of those 10 items that constitute the CaseManagementScore. In addition, the data of 35 further items are available.
Risks for pressure ulcer and falling have been identified and the necessary interventions have been initiated on the basis of guidelines.
Further, the differential diagnosis of malnutrition has been triggered by the score-system.
The post-discharge problems have been recognised during the first 24 hours and at that time already, contact has been made with an ambulant nursing service.
At the date of her discharge from hospital the following nursing sensitive outcomes can be stated:
Neither a pressure ulcer nor a fall has occurred although the risk has been very high.
Through appropriate training measures, the risk of a continuous liquidity deficit could also be strongly reduced.
Finally, all data could be integrated into the in-house data base and be analysed. In particular it has been examined if the changes of Maria’s CaseManagementScore matches with typical changes of ePA©-data for identical diagnoses or if there are any deviations. In addition, the correlation of ePA©-data with the Diagnosis Related Group and the patient comorbidity complexity level are analysed.

[FOLIE: EPA© - PERSPECTIVES]

Despite the first positive experiences with ePA©, there is still something left to do:
At the moment, we are about to conclude the theoretical foundation of ePA©.
A software is being programmed to facilitate the psychometric testing. To this end, all patients of cardiology, neurology and accident surgery shall be assessed with ePA© in a comprehensive 6-months-evaluation.

As soon as the data are evaluated and we can prove which of the objectives can actually be achieved with ePA©, a multi-centric application shall follow. There are already several demands from interested hospitals to take part in this next step.
We can also imagine the cross-sectoral use of ePA© for this would allow for an analysis of changes and outcomes over the whole care process.
With increasing data volume, it will then be possible to identify correlations between care dependency and typical case progressions.
In any case, we are already looking forward to see if any further possible applications will emerge over time.

[Folie"Synthesis Thoery-Practice]

One important objective of our work is to provide applicable instruments to the nursing staff which can be used to support their daily work as well as to make nursing visible – without neglecting the scientific rationale.
With ePA©, we believe we have found one possibility to reduce the gap between theory and practice.
Thank you very much for your attention.

Contact:
Dirk Hunstein, RN, Dipl.-Pflegewirt, cand. Dr. rer. med.
HSK Nursing Research and Development
Ludwig-Erhard-Strasse 100
65199 Wiesbaden, Germany

phone: +49(0) 6 11 / 43 – 31 79
mailto: dirk.hunstein@hsk-wiesbaden.de