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## **Evaluation of the training plan for the introduction of computer-based nursing documentation and of the nursing classification DiZiMa (Diagnosen – Ziel – Maßnahmen®)**

**Steiermärkischen Krankenanstaltengesellschaft m.b.H (KAGes)  
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*The documentation of the nursing process is an important but often neglected part of clinical documentation. The usefulness and general need for the application of trainings has been closely examined in relation to the nursing process and care planning. The aim of this study was to evaluate the educational application of current education models to computer-based nursing documentation systems and nursing diagnoses. As the basis of this research project an evaluation study with multicentric, retrospective cross-sectional design was used, and included 712 nurses. The computer training proved to have no effect, however the training about nursing diagnostic shows a significant effect on the satisfaction scale and has improved the handling with the nursing process documentation. As regards the conception of future computer training, they rather ought to be built on the basis of nursing concepts. A further support is absolutely necessary, where the focus needs to be on the nursing diagnostic process.*

### **1 Introduction**

The re-organisation of conventional nursing documentation to IT-based nursing documentation is a strategic issue in the KAGes. Since 1999, the Styrian KAGes - which comprises 18 hospitals, a university medical centre with 20 university clinics and a total of 6000 beds – has been gaining experience of the implementation of IT-based nursing documentation and of the KAGes standardised nursing classification of DiZiMa®.

In Austria the discussion about documenting care gathered momentum with the amendment of the Health and Patient Care Law (GuKG) 1997. The GuKG 1997 stipulates full documentation of the individual steps of the nursing process according to §5 and §14 (Weiss-Faßbinder, Lust 2010). The nursing process, however, has established itself with rather less enthusiasm in nursing practice (Abt-Zegelin et al., 2004a). This lack of enthusiasm is shown by nursing staff paying little attention to nursing records and neglecting documentation about near-patient care (Abt-Zegelin et al., 2004b).

#### **1.1 Problem statement**

In the course of the practical implementation of nursing process methods many problems, such as the amount of time involved and unclear benefits for patient care, have been reported (Maher et al., 2002). Therefore, the KAGes is making an effort to offer regular feedback to practitioners about their documentation habits to improve the quality of nursing documentation and to reduce the amount of work involved in record-keeping. In addition, random analyses of nursing documentation are carried out by KAGes nursing care experts. From the results of the evaluations it could be seen that nursing staff exhibited major deficiencies concerning nursing process documentation, but above all with nursing diagnoses.

The information gathered from the evaluation is consistent with those deficits of nursing staff dealing with nursing documentation described in literature (Bartholomeyczik, Morgenstern, 2004; Ehrenberg et al., 2004; Törnvall et al., 2004; Müller-Staub et al., 2007). A variety of international surveys (Nilsson, Willman, 2000; Ehrenberg, Ehnfors, 2001, Ehrenberg, Birgersson, 2003, Ehrenberg et al. 2004) describe the lack of understanding of the nursing processes as a weak point. Furthermore, disparate documentation of the process steps, the compilation of nursing diagnoses as well as the inaccurate evaluations of the nursing results are described. It is reported that a further weak point is the fact that treatment plans are not individually compiled for the patient. Either there are deficiencies in the theoretical foundation and/or in a common understanding about nursing. Moreover, it was found that the nursing documentation is geared towards doctors' records. An added problem, contrary to the incompleteness of nursing documentation is redundancies in the system which increase the amount of time needed for daily documentation. These problems concerning documentation are confirmed by nursing staff and are also recorded in German-language literature (Ammenwerth et al., 2002; Abt-Zegelin et al., 2010; Rappold, 2010). The issue of theoretical knowledge in reference to treatment planning is, however, treated as a side issue in many studies.

In the surveys carried out by Müller-Staub et al. (2009), Törnvall et al. (2004) and O'Connell et al. (2000), however, the need for specific training courses for target groups is dealt with. Larrabee et al. (2001) confirm in their research the need to offer specific training and workshops about nursing documentation. Comprehensive and on-going training in the area of the nursing process and treatment planning can assist in the comprehension of the documentation.

The training plan concerning the introduction of IT-based nursing documentation and the conveying of the nursing diagnostics process in the KAGes has not been subject to any evaluation since its implementation in 2001. In light of the above, the current training plans were evaluated and rated regarding efficiency and effectiveness.

## 1.2 Objectives

The aim of the study was to evaluate the current training plans for the implementation of computer-based nursing documentation and the introduction of the standardised nursing classification DiZiMa® in KAGes in order to discover possible strengths and limitations. Moreover, the measures supporting the implementation of nursing documentation in practice were investigated. The evaluation should also answer the question about practicability and participant satisfaction with the training programme for the implementation of computer-based nursing documentation and the nursing classification DiZiMa®, so that informed, practically-oriented decisions about future training plans can be made.

## 1.3 Points of issue

The following questions arose from the above-mentioned issues:

1. How satisfied are employees with the central training plan for the introduction of IT-supported nursing documentation?
2. How satisfied are employees with the decentralised training plan for the introduction of IT-supported nursing documentation?
3. Which improvements in the training plan do the employees expect when IT-supported treatment planning is implemented?

## 2 Project description of the openMEDOCS nursing and DiZiMa®

In 1998, the Styrian KAGes decided to introduce a new hospital information system (KIS) for the administrative and medical/nursing documentation. The ISH\*Med programme from Siemens (formerly T-Systems Austria) was planned for doctors' and nursing documentation. The implementation of the software for the new hospital information system was effected under the project name "openMEDOCS" (medical documentation system).

The objective of the KAGes project "openMEDOCS nursing" was to implement the software for nursing documentation. The nursing module in openMEDOCS is very similar to the previously used paper-based documentation and details all six steps of the nursing process, from nursing assessment to treatment planning using the standardised nursing classification DiZiMa®, intervention documents and evaluation of objectives to the writing

of a nursing report. In addition, it makes it possible to generate forms (monitoring form, Braden scale, fall log, etc) and to enable communication between occupational groups (ward rounds tool).

As part of the first phase of introduction in 2001, there were no diagnoses in the computer system and treatment plans were made using freely formulated diagnoses. To make nursing documentation uniform throughout the company, a strategic decision was made to develop standardised diagnoses by means of the DiZiMa® project. DiZiMa® deals with a standard nursing classification system for the KAGes, which is made up of diagnoses (title of diagnosis, definition), etiologies, symptoms, risk factors, pre-requisites, resources, treatment goals and nursing interventions.

After 10 years of development work and the subsequent wide range of diagnoses, departments other than standard areas of specialist medicine have also been completely covered – psychiatry, neurology, geriatrics, obstetrics, childcare and care of juvenile patients. They form the basis for the assessment of an individual's reaction to health problems as well as for the choice of appropriate nursing intervention to reach a defined goal concerning care. While developing the DiZiMa® nursing classification, due account was taken of scientific criteria and legal demands as well as practicability (Walzl, 2008).

### 2.1 Implementation of openMEDOCS nursing and DiZiMa®

In the course of the more than 10 years of planned transition process, conventional nursing documentation was gradually replaced by computer-supported nursing documentation. As a supportive measure during the reorganisation, a central training seminar is being introduced prior to the introduction of computer-based nursing documentation. This seminar consists of an eight-hour training programme for the IT application and, if necessary, a supplementary four-hour course concerning the diagnosis process is offered. In addition at the operational start and during the first two weeks of the reorganisation on-site support will be available. However, there are new employees or those who were on maternity leave who took up their nursing duties in the company after the implementation of IT-support. These employees have received an in-house introductory course. For this local training module there is no single training plan for the whole organisation. For this reason, the training differs according to hospital which therefore affects the quality of instruction.

In addition to the training courses, nursing staff have comprehensive instruction material and literature at their disposal. The KAGes uses the dissemination system as direct support during the reorganisation of treatment planning. "A disseminator is a person who passes on knowledge or information and thereby contributes to its circulation" (translation of entry in Duden dictionary, 2005, page 684). This should ensure that changes can be implemented quickly and efficiently and realised correctly.

## 3 Methodology

For this study a formulative evaluation with a multi-centre, retrospective and descriptive-quantitative cross-sectional design was chosen.

### 3.1 Research tool

As no suitable research tool for the evaluation of the training concept was available, after reviewing literature (Ammenwerth et al., 2001; Darmer et al., 2004) and taking into consideration research questions as well as legal and professional aspects, the following relevant dimensions could be identified: type of introductory training, extent of training, support, satisfaction, motivation, attitude towards and implementation of nursing documentation. These seven dimensions formed the basis of the research tool. Subsequently, this was followed by operationalisation to generate directly observable variables. The survey was the subject of a critical discussion by three panels of experts. Expert knowledge and professional experience led to valuable suggestions for content of this component.

The questions developed were summarised in three main topics. Parts A and B of the survey comprised the dimensions "Introductory training, extent of training, improvement and support measures and satisfaction". In Part A consists of nine elements and investigates IT-user training and Part B also comprises nine elements and deals with instruction concerning diagnosis procedures.

Part C consists of 16 components investigating "confidence, attitude towards and implementation of nursing documentation". Each of these components was assigned a parameter value, the values differing according to the scale. The survey, depending on the component, is based on a nominal, ordinal or cardinal scaled response. In addition there was one question to be answered in the respondent's own words to enable comments to be made and the respondents were also asked to supply socio-demographic data (year of birth, gender, extent of employment, ...).

The survey was then submitted to a panel of experts who examined it for content validity. Before the survey was carried out, it was submitted to a form of respondent-debriefing as in Jacob and Eirnbter (2000) and a subsequent pre-test.

### 3.2 Sample

The inclusion and exclusion criteria led to seven regional hospitals and nine clinics of the University Hospital, Graz being included in the survey. At the time of the survey (September - November 2010) 998 qualified nursing staff working on wards with beds were included in the survey.

The aim of defining inclusion and exclusion criteria was to narrow down the survey and to generate comparable units of analysis. For this reason, Styrian hospitals in a variety of locations were included, including individual clinics from the University Hospital, Graz. One inclusion criterion was that the computer-supported nursing documentation was introduced in the hospitals or university clinics between spring 2007 up to and including May 2010. Out-patient and intensive care wards were excluded from the survey as were operating areas as in these specialist departments other types of nursing documentation and/or computer programmes are used.

### 3.3 Data acquisition

Following approval by the collegiate boards of the individual hospitals and the Central Works Council of KAGes the study was introduced at on-site heads of ward meetings. In the course of these introductions, one person from nursing was named as a contact person who was responsible for ensuring correct procedure, passing on information and handing out the surveys.

Those participating in the study sent back the completed questionnaires in the supplied return envelope via internal mail (Clinics of the University Clinic, Graz) or put them into the boxes provided on the wards (Styrian provincial hospitals) which were collected directly from these hospitals.

### 3.4 Ethical Aspects

For this study a written request regarding the necessity of ethical approval was made to the ethics committee of the Medical University of Graz. The ethics committee did not find it necessary to submit the concept of the study. In the letter accompanying the survey, the study participants were guaranteed anonymous and confidential treatment of the data and they were informed that participation was on a voluntary basis.

### 3.5 Data analysis

The data were evaluated with help of SPSS Version 17.0. The analysis and depiction of the results were carried out based on uni and bivariate frequency distribution. Using the frequency distribution and non-parametric tests (Mann-Whitney U-Test, Kruskal-Wallis-Test) a description of the differences between groups and/or variables was carried out according to the scale level and distribution. The level of significance was set at  $\alpha=5$ . The frequency calculations and the calculation of all subsequent results are based on weighted data.

For the open question a content analysis approach according to Mayring (2007) was elected.

## 4 Results

From the 998 questionnaires distributed, 712 could be analysed - a response rate of 71.3%.

The requested socio-demographic data are shown in the sample characteristics regarding sex, age, number of working hours, professional experience, experience of the computer-based nursing documentation and these are summarised in Table 1.

Sample	
n=712 (100%)	
sex	
female	630 (88.5%)
male	41 (5.8%)
missing data	41 (5.8%)
age	
mean	35,3 (SD±10.74)
extent of employment	
full-time	459 (64.5%)
part-time	218 (30.6%)
missing data	35 (4.9%)
experience in years	
mean	13.7 (SD±11.11)
IT-based nursing documentation in months	
mean	24.4 (SD±18.58)

Tab. 1 Socio-demographic data

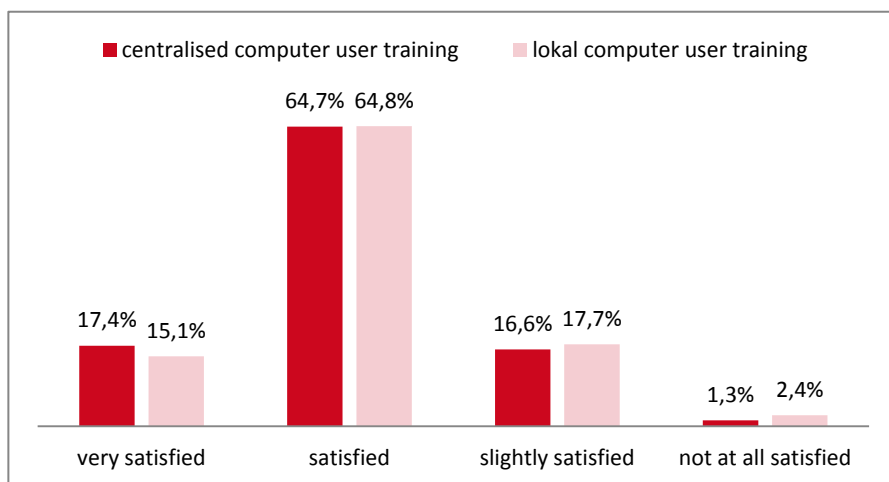


Fig. 1 Satisfaction computer user training

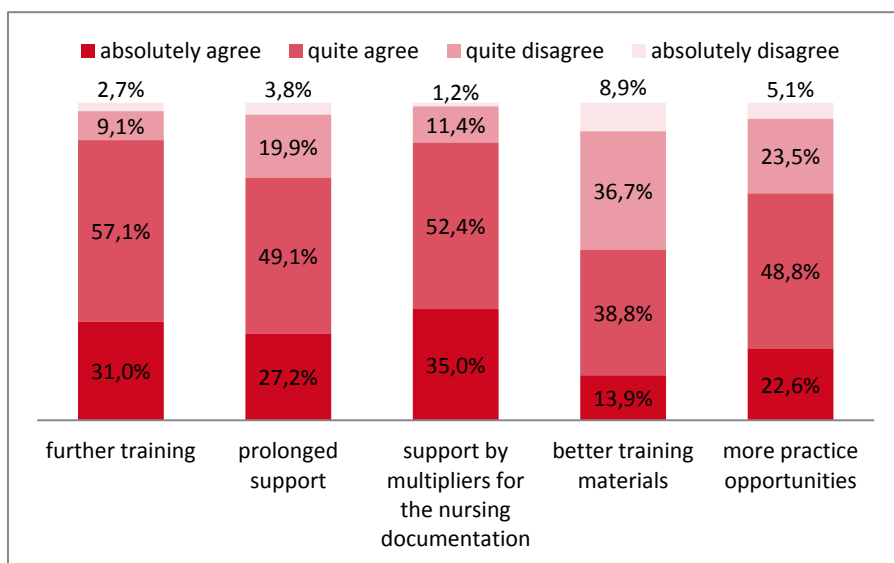


Fig. 2 Improvement computer user training

## 4.1 Centralised/local computer user training

The respondents were asked to indicate which training modalities regarding IT-user training they had gone through. From the 712 (100%) nursing staff asked, 151 (21.2%) had received centralised IT user training and 236 (33.2%) local (in-house) instruction and 325 (45.6%) had received both a centralised and local training. Multiple answers were possible for this question.

### 4.1.1 Satisfaction

Respondents were asked how satisfied they were with the training modalities. Satisfaction with the entire IT user training (n=691) is shown as comparison of centralised and local training in Figure 1, whereby no significant differences can be seen.

A mean comparison test between the groups of nursing staff with a centralised and local IT user training and the satisfaction with the extent of the IT user training was carried out. The data show no significant mean differences between the two groups (Mann-Whitney-U-Test 47979,000; Z - 1,256; p=0.209; 2-pages). This means that nursing staff who have gone through the centralised IT user training are just as satisfied as those with local training.

### 4.1.2 Improvement measures

Another goal was to determine improvements from the point of view of the nursing staff. The results in Figure 2 show which measures regarding computer use for "openMEDOCS-pflege (nursing)" would improve comprehension of computer-based nursing documentation according to the respondents. It would seem that 611 (88.1%) of nursing staff call for further training and 607 (87.4%) call for support by disseminators as improvement measures for the computer programme use.

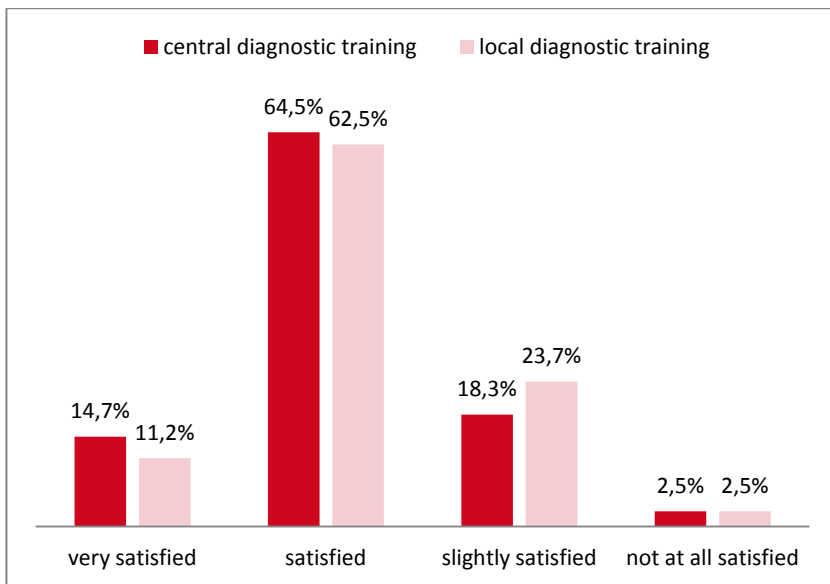


Fig. 3 Satisfaction diagnostic training

## 4.2 Central/local diagnostics training

Regarding diagnostics training, nursing staff were also asked which training modalities they had experienced. Out of 712 (100%), 13 (19.5%) of the nursing staff had received training in a central training seminar, 348 (48.9%) local in-house instruction and 225 (31.6%) both central and local training.

### 4.2.1 Satisfaction

The analysis in Figure 3 represents the incidence in percent of satisfaction with both central and local diagnostic training (n=681).

It is significant that nursing staff with central training (14.7%) were more satisfied with the amount of training than the colleagues with local training (9.9%). In a comparison of the satisfaction with central and local diagnostic training, a statistically significant difference could be reported between the groups examined (Mann-Whitney-U-Test 48445,500; Z -3,173; p=0,002; 2-pages).

### 4.2.2 Improvement measures

In addition, the incidence of improvement was reported with reference to nursing diagnostics (Figure 4). The measures to improve diagnostic comprehension is remarkable as 601 (89.8%) see further training, 626 (91.9%) support by disseminators for nursing documentation, and 569 (83.5%) case discussions as useful interventions.

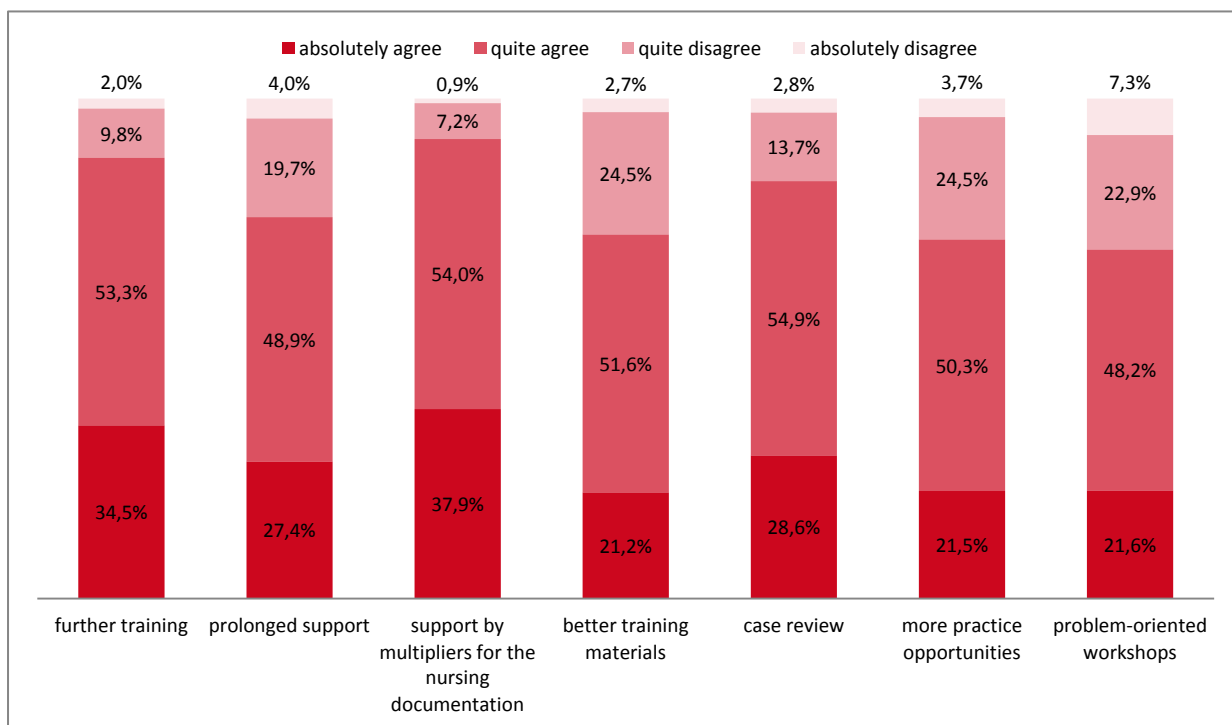
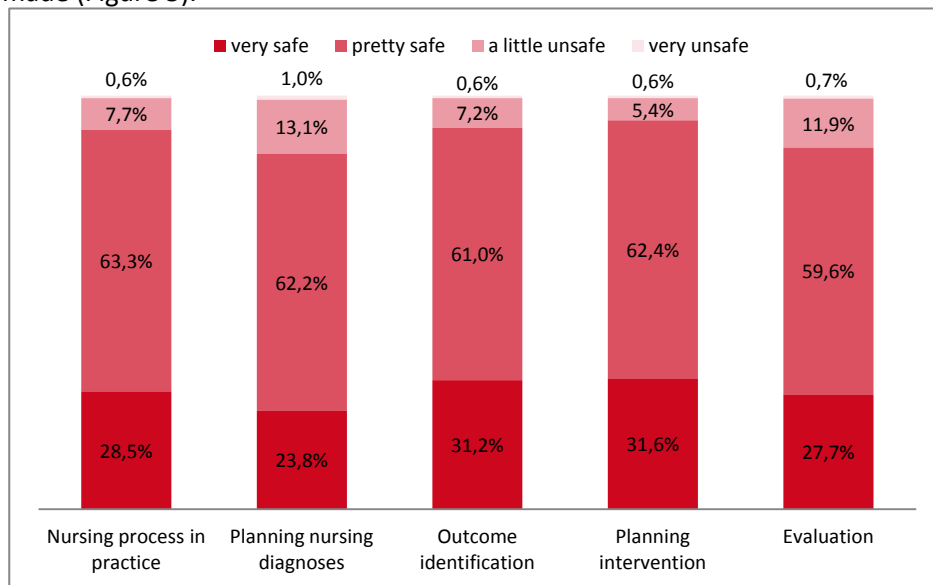


Fig. 4 Improvement diagnostic training

### 4.2.3 Security

Also of interest were the effects of nursing diagnostics training on those dealing with nursing documentation. Questions were also asked about confidence when dealing with the nursing process in practice, with reaching nursing diagnoses, the selection of care goals, setting time limits, the choice of activities and with the evaluation of care goals made (Figure 5).



It is striking that only 201 (28.5%) nursing staff are completely confident with the practical implementation of the nursing process. Furthermore only 167 (23.8%) of the respondents felt completely confident reaching nursing diagnoses and 195 (27.7%) in the evaluation of care goals. When comparing confidence (dealing with the nursing process, diagnoses, treatment goals, nursing interventions, time limits and evaluations) after centralized and local nursing diagnostics training

Fig. 5 Security

there is a significant difference in the results (Mann-Whitney U test 50917.500, Z -2.829, p = 0.005, 2-sided), with nursing staff feeling more confident when dealing with nursing documentation after a central training seminar than those who participated in a local training seminar.

## 5 Discussion with Limitations

This study shows that fewer than a quarter of respondents have received central computer training, one-third have received local computer training and almost half have participated in both centralised and local computer use training seminars, but their satisfaction at the amount of training did not differ significantly. However, it is noticeable that a high percentage of respondents (65%) indicated that the level of centralised and local training was only “fair” which suggests that both forms of training are in need of improvement. Significant improvements concerning computer programme use was said by respondents to be the support of disseminators, further training and in-house on-site support for a longer period of time.

Nursing staff were significantly more satisfied with the centralised diagnostics training than with local training. It is also striking that concerning centralised diagnostics training a high proportion of respondents (>60%) rated both kinds of training only as “satisfactory”. This in turn leads to the conclusion that centralised and local diagnostics training require improvement. From the viewpoint of the nursing staff, support from disseminators, further training as well as case discussions are useful measures which can improve the understanding of diagnostics.

Of note is the self-assessment of nursing staff regarding their confidence when dealing with nursing documentation. Nearly a quarter of the respondents indicated that they felt completely certain with the practical reorganisation of the nursing process and of the diagnosis procedure.

When compared in terms of certainty in dealing with the nursing documentation, the results show that nursing staff who have attended a central diagnostics training seminar feel more at ease dealing with nursing documentation. Similar results can be seen from other studies by Müller-Staub et al. (2009), Törnvall et al. (2004) and O’Connell et al. (2000), whereby the need for targeted training for specific groups is pointed out. Larrabee et al. (2001) also show that comprehensive and continuous treatment procedure training can enhance understanding of the documentation.

Ammenwerth et al. (2002) describe computer support as being initially just a tool, which can only be beneficial together with supportive measures such as training seminars on nursing procedure documentation using a nursing basis in order to achieve an improvement in quality. From the perspective of the respondents, an important improvement measure is support from disseminators. Further support was named as advanced training both for IT-applications and for diagnostics. This is in accordance with the results of other investigations (Darmer et al., 2006; Karlsen, 2007; Müller-Staub et al., 2009; Müller-Staub et al., 2010), whereby ancillary training in particular that dealing with diagnostics, nursing goals, nursing interventions improves the quality of nursing documentation. In addition, the respondents consider regular case reviews a reasonable measure for improvement. Case reports in literature (Müller-Staub et al., 2007) are referred to as a good method to promote critical thinking in nursing and which may significantly improve our understanding of treatment planning.

The results of this study are consistent with the results in current literature and could have a strong impact on the design of new training interventions in order to improve the quality of nursing documentation. In addition, the results of studies provide a good basis for the development of instruction in health and nursing schools, as well as be utilised for practical guidelines for students.

Although central diagnostic training was explained in detail in the survey, it appears that a very high proportion - at 51.1% - of nurses participated in central nursing diagnostics training. It cannot be completely ruled out that centralized and local seminars could not be differentiated between by the nursing staff. Thereby it is possible that there may be limitations to the study.

### 5.1 Conclusions

Overall, it can be concluded from the results that training and support measures can be optimised. In addition, the need for specific training, particularly concerning diagnostics has been proven as has the need for continuous professional support for nursing staff carrying out clinical work in order to improve critical thinking skills regarding the diagnostic process.

Furthermore, institutions at which nursing staff work, must raise awareness of the importance of nursing documentation. This optimisation of in-house support and a strengthening of the position of disseminators for nursing documentation is absolutely essential.

### 5.2 Research prospects

The study results provide a good basis for further investigation of the quality of nursing documentation. How effective the training interventions, improvement measures and in-house support have been on the quality of nursing documentation should be examined by a further study in the form of a document analysis. As a full survey is exceedingly involved, controlled research design with a well-planned sample is recommended.

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